

Taking aquaculture offshore, beyond the blue horizon

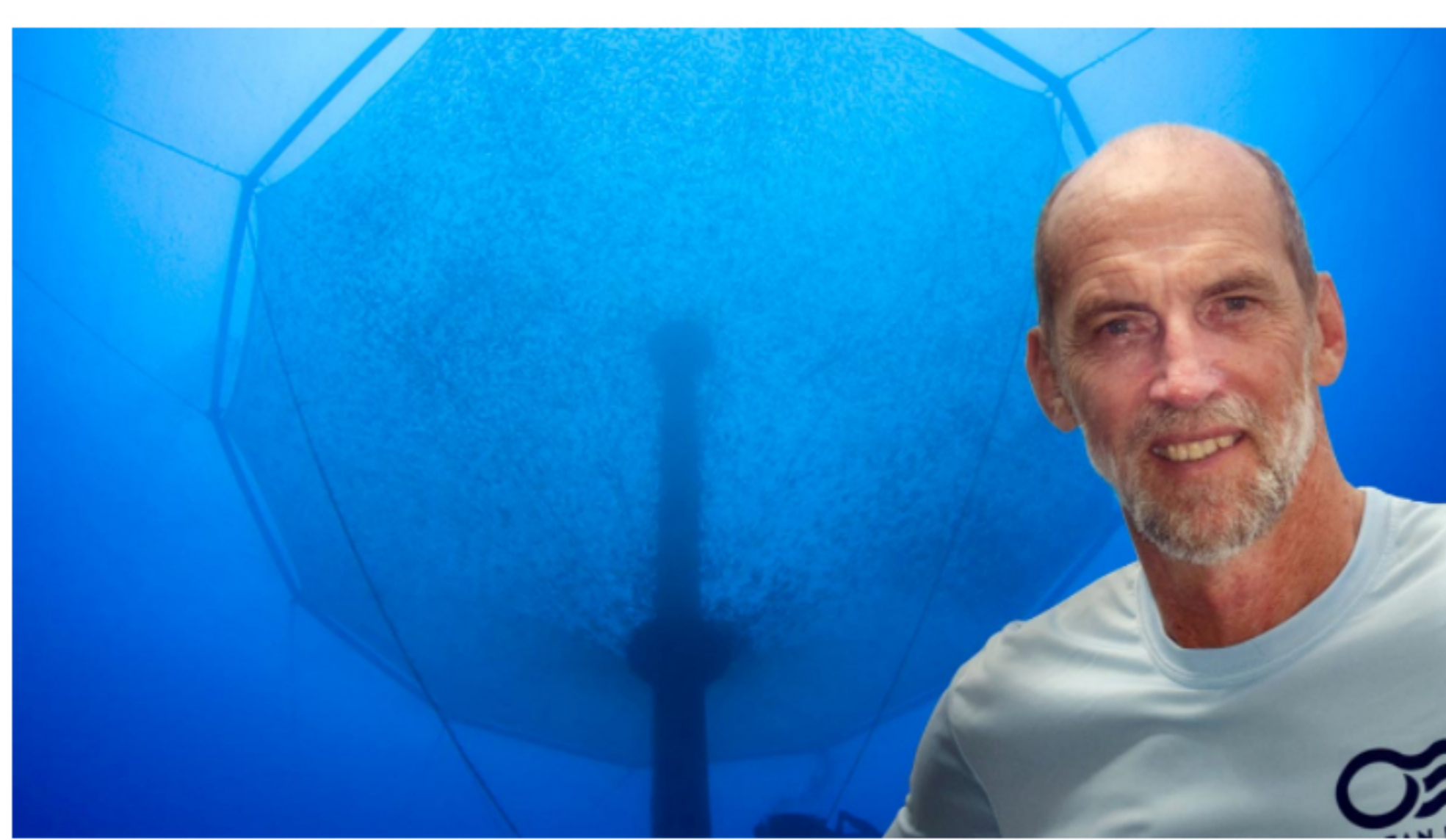
By Neil Anthony Sims / 30 July 2021



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Putting fish back into the ocean? Not such a crazy idea – and we just might save the planet at the same time.

Earth's oceans are – to use the French idiom – pretty much screwed. From time immemorial we have treated the seas like a cesspool, and a garbage dump. We have relied upon our world's biggest saline solution to soak up the gasses and the heat that we pump into the air. We have scraped and scoured the waters, and whatever got caught up as 'collateral' mostly died on the deck. "Plenty more fish in the sea," we said, as we poured more subsidies into fishing fleets.

It is, in the truest sense, a global crisis. The oceans are humanity's true common wealth, and what happens in waters near Shanghai or Peru sooner or later sloshes around and washes up on the beaches of Sydney or Perth.

I began my career in fisheries management, but found the misalignment of incentives disheartening. So I felt drawn to aquaculture – to the more hopeful possibilities of giving back to the ocean, rather than just taking. I tinkered with pearl oysters for a while, but they were just trinkets and baubles: we needed to feed humanity – feed them fish that we grew ourselves.

So we adapted our pearl oyster hatchery technologies to marine fish larval culture, and looked for where we might grow out the fingerlings. In Kona, Hawaii, where we were based, the answer seemed self-evident: offshore. Any decent toss from Kona's lava cliffs can land a stone in offshore waters, with nothing to the west but water until you hit Taiwan, and the same to the south, until Antarctica.

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Putting fish *into* the ocean has become pretty controversial (though it's perfectly *okay*, somehow, to pull aplenty of them *out* of the ocean? And it's perfectly pastoral for bovines to belch methane and nitrous oxide?). Humanity seems to have forgotten how – once we were done wiping out buffalo, dodos and passenger pigeons – we turned to farming cattle and chickens.

But quality matters. In the ocean, as on land, bad farm management bites you pretty quickly. The modern aquaculture industry is therefore now a well-spring of innovation, borne of the necessity of stewardship. Almost all – legitimate – environmental issues with earlier forms of fish farming are addressable – by sensible siting to minimise water quality and benthic impacts; improved fish nutrition; better understanding of animal health; vaccines that almost totally eliminate antibiotic use; and robust engineering and oceanographic modelling to minimise fish escapes or marine mammal entanglement.

There's been a lot of discussion recently in Australia about inshore aquaculture, in particular salmon. Offshore aquaculture addresses many of those concerns. Still, permitting offshore, in the public domain, demands patience. In Kona, it took more than three years to acquire the first permits for our offshore farm, culturing amberjack (a kingfish cousin now branded as 'Hawaiian Kanpachi'). There was initially strident opposition from anti-aquaculture activists. But our guiding principle was to grow our fish in their natural habitat. By moving production into deeper water, further offshore, the potential ecosystem impacts could be drastically reduced. This aspiration has been borne out by sophisticated modelling, and extensive environmental monitoring around the kampachi operation in Kona, and an offshore cobia farm in Panama.

One of the five major recommendations from the recent United Nation's High-Level Panel on Global Climate Change and the Oceans was that humankind needs to transition to less impactful marine-based foods.

"So, what do you feed them?" is the perennial concern. Well...what do wild fish eat? Mostly fish, yes, but if we are going to feed the world, we cannot do that on the backs of Peruvian anchoveta. Market forces – and our industry's intrinsic environmental ethic – have fomented a proliferation of alternative proteins and oils from agriculture and biotech. In trials in Kona, we have been able to completely eliminate all marine-sourced inputs in kampachi diets, by upscaling pet-food grade poultry meal, soy proteins (aka tofu), flax oil, and crucial omega-3 oils from microalgae. We are proving that you don't need to feed fish to grow fish, any more than you need to feed crushed canaries to your cat.

The imperatives for growing more seafood are increasingly pressing. It's no longer simply that more humans are more affluent, and want to eat more sushi. It's not just our doctors telling us that it's better for heart health and brain health. It's that to feed 10 billion people with beef, at the rate that Australians eat hamburgers, would leave Earth's soils looking more like Mars, and our atmosphere more like Venus. Land area limitations, freshwater constraints, and – most tellingly – the global climate crisis all demand that we begin to source more of our food from the oceans.

There is now a growing body of science, and an increasing consensus – from both academia and environmental NGOs – that we must move offshore. One of the five major recommendations from the recent United Nation's High-Level Panel on Global Climate Change and the Oceans was that humankind needs to transition to less impactful marine-based foods. We might also use macroalgae (seaweeds) to sequester carbon dioxide. We need to start to see the oceans as less a victim of the global climate crisis, and more as part of the solution.

A global analysis of the potential yield of fish, bivalves and seaweeds from offshore aquaculture projects harvests could be up to 100 times the current worldwide seafood consumption. 100 times! So the Next Big Thing – we should hope and pray – will be the expansion of aquaculture into the offshore realm. China and Norway have already deployed fish pens that look like offshore oil rigs, that can contain up to 1.5 million salmon. Net pens twice that size are now under construction.

Australia recently waded out in the right direction, through the set-up of a Blue Economy Co-operative Research Centre, to develop sustainable energy and aquaculture technologies for offshore, in a partnership between government, research institutions and industry. This needs to be matched by policies that support offshore growth – that streamline the permitting process, while still ensuring common-sense levels of environmental oversight. With secure tenure for offshore operations, catalysing investments should then flow.

Australia's ocean area – within our Exclusive Economic Zone – is around 130% of the total land area of the continent. But our wide, brown land is no longer simply girt by sea. Our future is out there – beyond the blue horizon.

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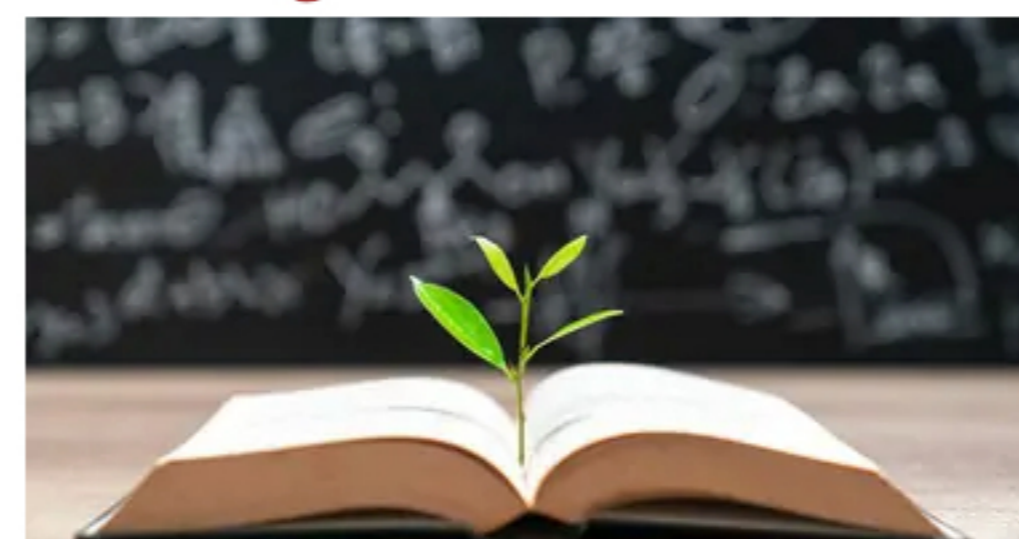
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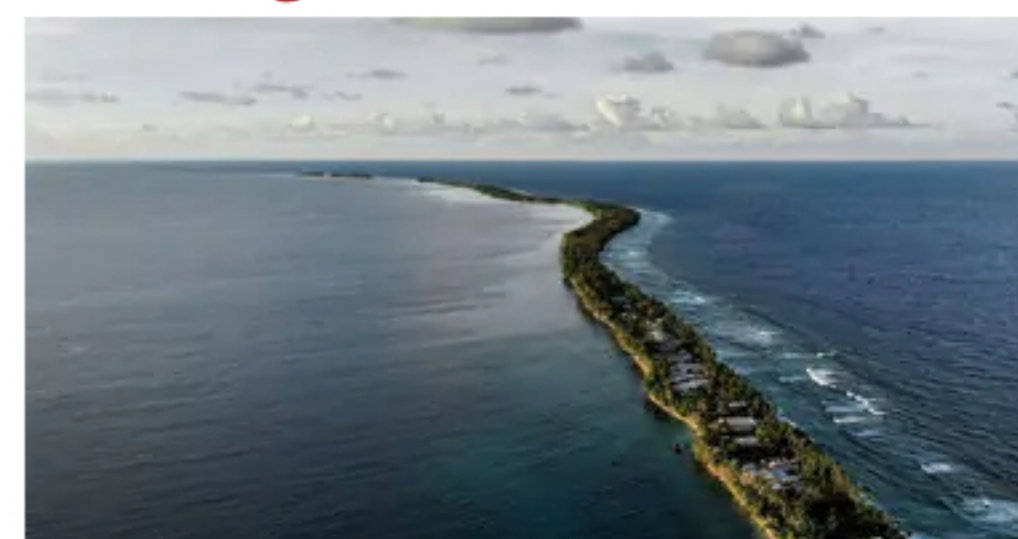
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