

The Ocean Fertilization Project

The ocean fertilization project has several aims:

1. Raise support for ocean fertilization
2. Develop, build and deploy ocean fertilization devices

Support for ocean fertilization

Climatebabes.com wishes to drive support for ocean fertilization, caring and protecting our oceans. We do so by making an appeal with the help of babes, as we do for other causes through our activities.



Angel (Angelicque) White, an expert on ocean nutrients

Iron fertilization

Ocean fertilization is often associated with iron fertilization. This method tries to add the limiting nutrient to top layer water by dumping iron into the sea. It has a lot of critics, we have no opinion about it.

[About iron fertilization](#)
[About the origins of iron](#)

We do not want to do this because first of all its effects are not well understood, because it takes way too much energy and because it doesn't solve the problem, which is lack of mixing and oxygen. Our oceans only contain iron because it rusts due to the oxygen present. If oxygen is depleted the ocean will return to a different chemistry and organisms that need iron will not survive.

Upwelling

We want to pump up water from the deep ocean where it is nutrient rich. This is called artificial upwelling. At the same time we want to inject oxygen into the deep ocean. For this we developed a concept that can be deployed autonomously.

[Natural Upwelling](#) is responsible for the richness of coastal waters.
[About fertilization experiments](#)
[another article](#)
[Ocean chemistry](#)

"Upwelling is an oceanographic phenomenon that involves wind-driven motion of dense, cooler, and usually nutrient-rich water towards

the ocean surface, replacing the warmer, usually nutrient-depleted surface water. The increased availability in upwelling regions results in high levels of primary productivity and thus fishery production. Approximately 25% of the total global marine fish catches come from five upwellings that occupy only 5% of the total ocean area."



The Ocean One

The Ocean One will be developed with as much partners in the field as possible. It requires only off the shelve parts and can be made en masse.

[About Phtoplankton](#)
[Phytoplankton issues](#)
[About phytoplankton](#)

The Ocean Two

We can oxygenize the ocean using underwater turbines.

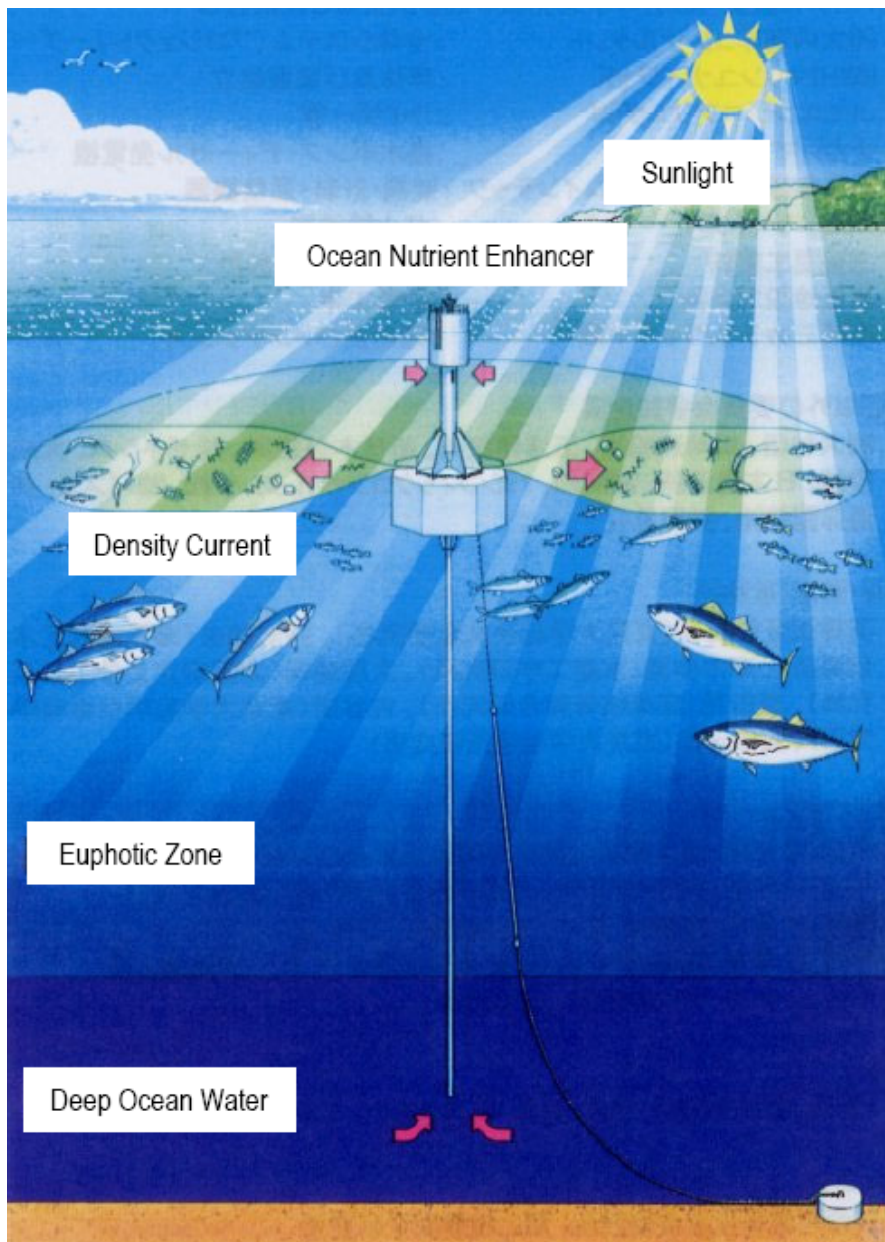


Artificial Upwelling Research

What is the potential of **Artificial upwelling?** . According to Prof. Dr. Andreas Oschlies's model it is 3 GT per year (Not sure if the capacity is maximized, but compare antropogenic production is **3.2 GT**), and there is a suprising upside of a cooling effect apparently slowing decomposition on land (that reduces co2 emissions and preserves plant species and cools the poles right?). Apparently the point is that the sequestered carbon is **hard to measure because it will be distributed across the landmasses in non decaying organic material** , well boo hoo! Another strange claim is an increase in CO2 emission once the upwelling pumps are halted (but why would you do that?).



Angel White at the Oregon State University did more practical research, using wave driven pumps. She learned you need to take the water from the right debth so it has just the right combination of nutrients and dissolved gasses (which she concluded is about 300 to 700 meter deep). Co-researcher Ricardo Letelier said "These vast regions (around Hawaii) of the open ocean may be perfect for sequestering carbon". More [here](#) .



Source

Artificial upwelling has enjoyed interest for many years now. One of the first studies was by [John D. Isaacs](#), who proposed to use wave energy to invert the density structure of the ocean and pump deep, nutrient-rich water into the sunlit surface layers. The technique has been proposed as a means to create fertile fishing grounds by [Brian Kirke](#) of the School of Engineering, Griffith University Gold Coast. [Roger Handschuh](#) [Gerald Schneider](#) [Enno Sebastian Schulte](#) proposed a design [C.T. Hsieh](#) et al. did experiments (pipe and buoy). There is the concept of [Stommel et al.](#) of 'a perpetual salt fountain' taken up by [Maruyama et al.](#) that claims to require no extra energy. They did a numerical simulation of which they share the 'upwelling calculator' and a flowchart at their site greenupwelling.com. Japan has been developing their so called **Ocean Nutrient Enhancer** mainly to create new fishing grounds. A quote:

The results from the real sea experiment lead us to believe that the **TAKUMI** type artificial DOW upwelling system can be feasible to increase a primary production and make a fishing ground in case of large size system of more than 1,000,000m³/day."

[upwelling experiences](#)

[More experiences](#)

[German research](#)

[Article](#)

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Deep ocean water

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