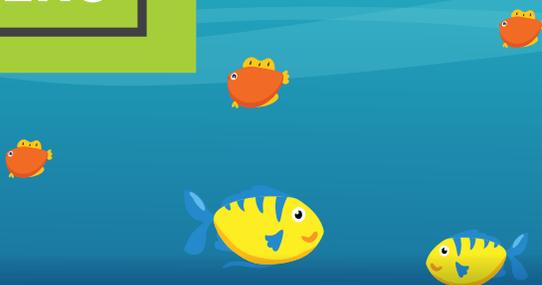


Can science and business work together to save the ocean?



Authors:

Henrik Österblom, Jean-Baptiste Jouffray, Carl Folke, and Johan Rockström

Associate Editors:

Madeleine Corcoran and Rachel Watson

Abstract

Do you like to eat fish? Our ocean provides the growing human population with valuable food. Seafood – like fish and shellfish – is an important business for some companies. A healthy ocean is essential if we are to keep eating seafood - and if companies are to keep making money from marine ecosystems. However, our ocean is in danger. *Overfishing* and unsustainable fish farming (known as *aquaculture*) pose threats to the long-term health of the ocean and the creatures in it. We wanted to explore how scientists and big companies could work together to benefit ocean life and the seafood trade. We shared our scientific knowledge with powerful companies and they then acted to protect the ocean. This approach allowed us to challenge the threats facing our ocean on an international level. We think that our science-business partnership could be a useful example of how to protect the environment where businesses operate.

Previously at SJK, we have referred to several oceans. However, there has been a recent push towards recognizing the ocean as a singular entity: the one ocean that unites us all (Figure 1). UNESCO's Intergovernmental Oceanographic Commission has embraced it with their "One Planet, One Ocean" tagline.

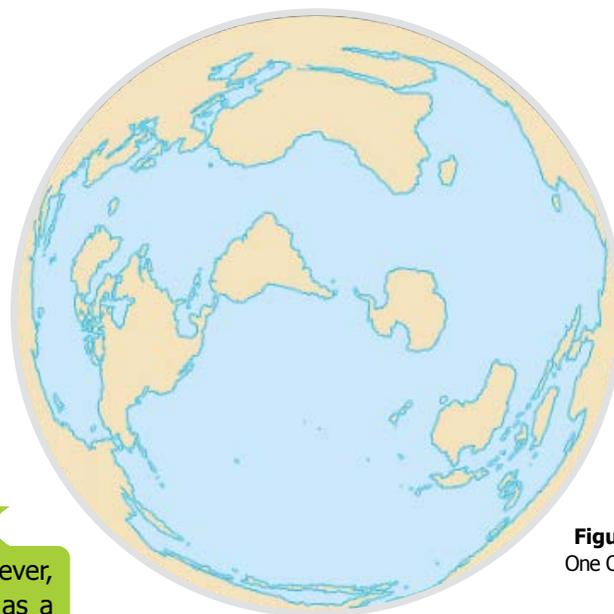


Figure 1:
One Ocean.

Introduction

Do you enjoy eating shellfish like shrimp or mussels? Have you tried sushi? Food from the sea is an essential and popular part of our diets. But do you know how it gets onto your plate?

Seafood is either caught in the ocean or farmed (aquaculture) in parts of the ocean (Figure 2). As with all of our interactions

with the natural world, if we don't do things in a responsible way, the environment will suffer – and that means seafood stocks could run out. Worse, our whole planet could be under threat if we don't look after our ocean. The ocean, and the creatures that live in it, support all of life.

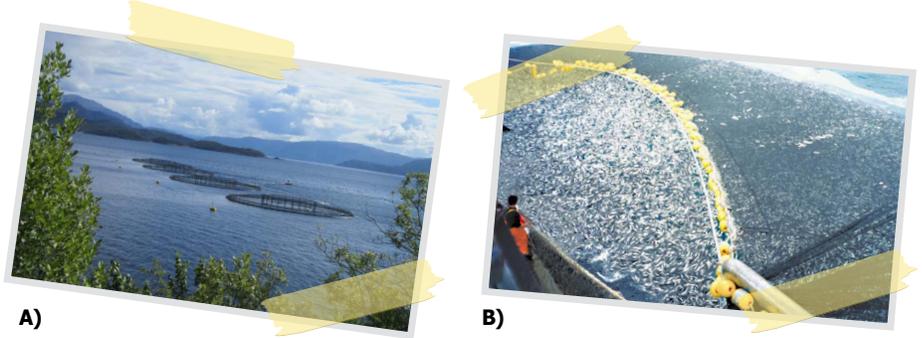
**Please see
Figure 2 on Page 2**

Figure 2:

- A)** Salmon fish farm in Norway
B) 400 tons of Jack Mackerel being caught in Chile.

Source:

- A)** Brataffe on Wikimedia Commons
B) C. Ortiz Rojas on Wikimedia Commons



Transnational corporations (big companies often working across many countries) have made it their business to catch and farm the seafood we eat. But if the seafood runs out, so will their profits. In the short term, they may want to farm and catch as much seafood as possible, but in the long term this will use up stocks (Figure 3).

As scientists, we know a lot about how to interact with the ocean in a sustainable way. It would be helpful if we could engage with these powerful corporations to help them behave in a way that is good for our ocean but also good for their business. This is what we worked on figuring out: how can science and business work together for the good of all? And what might be the drawbacks of such a partnership?

Figure 3:

Some fishing practices are especially damaging to the environment. Bottom trawling, for example, where a boat drags a large weighted net along the ocean floor to 'scoop up' its catch, can damage the aquatic life there, leaving a blank landscape behind. See the deep sea ocean floor **A)** before trawling and **B)** afterwards. Trawlers can also unintentionally catch (and kill) a lot of other creatures - sea turtles, dolphins and other fish for example.

Source: CSIRO Marine Research on Wikimedia Commons.



Methods

Step 1: Who rules the waves?:

Over a period of two years we collected and analyzed data about seafood companies. We wanted to find which of them are "keystone actors," meaning the companies that catch or farm the biggest and most important fish stocks. Any actions they take have a huge effect on the whole ocean ecosystem and the whole ocean business system.

We identified 13 companies that account for 11-16% of all wild catches. A handful of them controlled up to 40% of the largest and most valuable fish stocks. They also dominate in aquaculture, farming the most valuable stocks, such as salmon and shrimp.

Step 2: Working together:

We needed to get the attention of the CEOs (Chief Executive Officer, basically the boss) of these companies. We knew face-to-face meetings would be best, so we approached the CEOs and talked to them about what we could offer as scientists. We made it clear that we wanted to support their business plans in the long term.

These meetings led to a conference that brought together scientists and CEOs. The business people discussed the challenges facing their industry and we scientists were able to provide advice about how they could meet these environmental challenges and do best for themselves and the ocean.

Results

Our approach was effective and led to the companies creating and signing the 'Seafood Business for Ocean Stewardship' (SeaBOS) agreement. Their commitment to looking after the ocean was even better than we had hoped! In fact, the companies arranged and attended a second and third conference to review and solidify their commitment to SeaBOS.

SeaBOS aims to tackle some of these problems:

- Stopping illegal fishing
- Ending *forced labour* of seafood workers
- Reducing the use of *antibiotics* in seafood production (antibiotics have a damaging effect on marine life)
- Addressing how the industry can limit and adapt to climate change.

Discussion

The big companies' commitment to facing the ocean challenges is promising, but there is still much to be done. We don't yet know if they will be able to succeed. Other 'green clubs' set up by businesses have sometimes failed to deliver long-lasting or deep change.

Our case study shows that when a group of scientific experts approach big business in an open-minded and supportive manner, we can work with companies to reduce their impact on the planet. It was essential that we did not just lecture the companies, we also listened to their concerns and worked with them to bring our two agendas together - healthy business and healthy ecosystems.

Scientists are used to working with governments to create environmental policy, and governments have a massive role to play. But working with business has its advantages, as they can adapt quickly and work across large areas of the world. However, scientists and business do not often talk to each other, and there are risks of misinterpretation and that the expectations are not met. If businesses connect to science and become better at cooperating, they are better able to tackle environmental issues and create positive visions for the future. After all, our ocean is interconnected – our response to the problems must be interconnected as well!

Conclusion

We think that our science-business partnership is a good example of a largely untapped potential: the power of business and science to prevent damage to the environment together. But there are also things you can do to support a healthy ocean:

- Only buy wild-caught seafood that is eco-certified as sustainable, for instance by the Marine Stewardship Council, or Friend of the Sea, or Monterey Bay Aquarium Seafood Watch.
- Only buy farmed fish that is certified 'farmed responsibly,' for example by the Aquaculture Stewardship Council or Best Aquaculture Practices.
- Keep up to date on which species of fish are sustainable by checking the Marine Conservation Society's 'Good Fish Guide.'
- Reduce your use of plastics, especially throw-away items like plastic cutlery and straws that often end up in the ocean.



Glossary of Key Terms

Antibiotics – a medicine that targets bacteria. In fish farms, antibiotics are routinely added to the water to stop fish getting sick in unsanitary conditions. This is dangerous because it can lead to the development of bacteria that are resistant to the antibiotics and are hard to kill.

Aquaculture – the farming of fish and other aquatic life, e.g. shrimp. Farms may be set up in parts of the ocean or in other bodies of water.

Ecosystem – a community of interacting organisms (plants, animals, microbes) and their environment. Each part of the ecosystem is connected to the other parts. An example of a marine ecosystem are coral reefs: large structures of coral growths which support a huge variety of species.

Forced labour – a situation where a worker is made to work either through violence, by being forced into debt to the employer, or being intimidated with threats of deportation or exposure to the authorities (in the case of undocumented migrants).

Overfishing – a situation when more fish are removed from the population than can reproduce in time to keep the stocks stable. The population therefore declines and even collapses. The Atlantic bluefin tuna is an example of a species under threat from overfishing.

Sustainable / Sustainability – in general, if something is sustainable, it is able to be maintained at a certain level or rate. When it comes to the environment, sustainability means avoiding using up natural resources in order to maintain healthy life on earth. Sustainable fish, for example, is fish that hasn't been fished or farmed in a way that damages the ocean, and isn't from a species that is under threat.

Stewardship – the role of supervising or taking care of something. For example, seafood companies can take on the role of caring for the parts of the ocean in which they operate.

Check your understanding

- 1 How does the seafood business potentially harm the ocean?
- 2 What are some advantages of science and business working together to address how industry impacts the ocean?
- 3 What do you think some of the difficulties of working with big business are, from a scientist's perspective?
- 4 What are some of the issues that the seafood corporations hoped to address in their ocean stewardship agreement (SeaBOS)?
- 5 Can you think of any other contexts in which science and business could work together to limit industrial impacts on the environment?
- 6 What can you do to help protect our ocean?

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