

HOW GLOBAL WARMING WILL AFFECT THE SEA FISHING BUSINESS



<https://aida-americas.org/es/blog/seminario-virtual-agregaciones-de-desove-de-peces-y-experiencias-de-regulacion>

What will the fishing business look like in the future if global warming continues? Is global warming really having a negative effect on the marine environment and the fish that live there? Will fisheries continue to be profitable in the future? Where does the greenhouse effect come about, and what is global warming in general? The answers to these questions will be discussed here.

WHAT DOES GLOBAL WARMING MEAN AND WHEN DID IT BEGIN?

Global warming has been discussed from the very moment it started. The ground is covered with a thin blanket of greenhouse gases. Were it not for this blanket, the temperature on earth would be around -18 degrees Celsius. It took scientists almost the entire 19th century to discover this phenomenon.

In 1896, the Swedish physical chemist Svante Arrhenius was the first in the world to theorize how CO₂ influences potential global warming. Arrhenius and other chemists of his day, as well as physicists, knew that the exponentially growing explosion of various fossil fuels after the great industrial revolution was leading to an increased greenhouse effect on earth. This industrial revolution was associated with the shift from an economy based on man-made and handicraft production to mechanical factory production on an industrial scale.

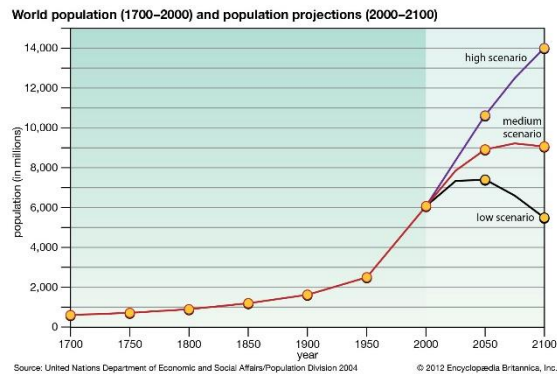
However, it was only when, in the second half of the twentieth century, the average temperature of the Earth rose to about 14 degrees Celsius that people began to wonder how much human civilisation is able to warm the climate. Thanks to all pioneering work from the 19th century, today's climate scientists can reliably predict future climate change on earth, but it depends on how much human civilisation will burn coal, oil, and gas and how much carbon dioxide and other greenhouse gases will be released into the atmosphere.

COMPOSITION OF GREENHOUSE GASES

Greenhouse gases are a component of the atmosphere that contribute to the greenhouse effect. Unfortunately, agriculture is responsible for a third of all greenhouse gas emissions to the atmosphere. It is because of the production of huge amounts of food that global warming is progressing at an alarming rate. Half of the CO₂ emitted into the atmosphere comes from the animal industry alone.

The number of people in the world is gradually growing, and therefore greater emissions of gases into the atmosphere should be expected. There are currently about 7.8 billion people in the world, but scientists predict that a peak will be reached in 2064, when the entire globe will be around 9.7 billion people. More people will need food, more food will produce more greenhouse gases, which will affect

climate change. Therefore, more and more calls are made to reduce the consumption of animal products, including dairy products and meat, and to encourage the consumption of, among others, fish. But will their quantity be sufficient for such a large population? How will the climate affect wild fish?



<https://www.britannica.com/science/population-biology-and-anthropology/Natural-increase-and-population-growth>

HOW CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS AFFECT THE OCEANS' WILD FISH

Statistics show that the situation in the oceans will not be the best. Scientists warn that up to 95% of the ocean's surface layer will be affected by severe climate change. Earth is a blue planet; 71% of its surface is covered by the oceans. Therefore, not only the earth, but also the oceans have their own climate. Global warming of the earth increases the temperature not only on the surface but also in the water. Due to the rising temperature of the oceans, less and less oxygen is dissolved in them. Climate change is causing a number of water problems. For example, the oceans are choking; so-called dead zones are formed in which there is simply no life due to hypoxia. Since the middle of the 20th century, due to the rising temperature of the oceans, half the coral reefs in tropical regions have been lost. Coral reefs play a very important role in



<https://www.theguardian.com/science/2009/may/26/future-planet-earth>

fishing, because it is in their regions that fishermen usually fish.

The temperature of the Earth's atmosphere is rising much faster than the water temperature. In 2019, the oceans were the hottest in the history of global seawater measurements dating back to the mid-20th century. One of the main factors governing the ocean's climate is the temperature of the water. Climatologists emphasize that more than 90% of the excess energy that remains in the climate, due to the increasingly thicker body of gases from many of the surrounding lands, is absorbed by the waters of the ocean. Nearly a quarter of the CO₂ pumped into the atmosphere by human civilisation is engulfing the ocean.

HOW GLOBAL WARMING AFFECTS WILD LIVING FISH IN THE OCEANS

Oceans are the largest ecosystem in the world. They are home to innumerable marine organisms. Wild sea fish are not able to adapt to changes in water temperature. Due to poor dissolving oxygen, or due to water warming and changes in their salinity, fish are unable to survive in their current habitats. They start to lack food in the hypoxic water, and they hike to regions more favourable to their living conditions. These journeys mean that many fish die while moving because of the obstacles they encounter, not only climate obstacles but also mechanical obstacles, such as structures like dams or bridges on their way.

Due to climate change, fish such as cod, which need salt and oxygenated water to reproduce, will be forced to travel and disturb the water ecosystem. Frequent and sudden changes in the weather cause the rate of movement of fish populations to increase, which inevitably affects the work of fishermen. The movement of fish habitats means that fishermen must look for them in the sea. This is particularly difficult and less profitable for small businesses. Fishermen have to invest in more and more modern fishing equipment. Their expeditions are increasingly costly and time-consuming, making fishing less and less profitable.

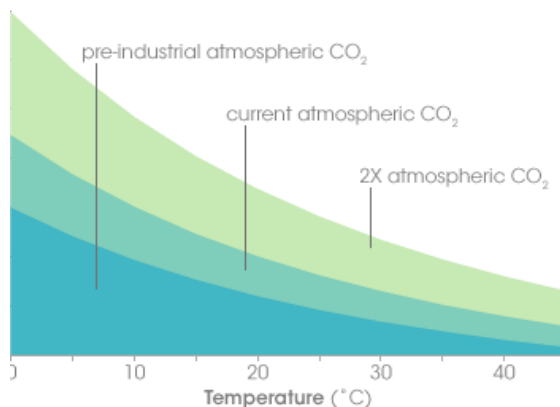
Dramatic changes in the weather, caused by global warming, are also adversely affecting the fishing business. Still, in some regions of the world, fish are the staple food source, which is associated with highly developed fisheries. Data shows that since 1961 the

annual consumption of fish in the world has been twice as high as the population increase.

Fisheries in developing countries are most exposed to the negative effects of climate change. Due to global warming, it is predicted that the catch of fish in these regions could decrease up to 50%. As a result, people can lose up to 70% of their income from fishing. More than two-thirds of developing countries in Africa, Asia, Oceania and Central America depend on local fisheries as their main sources of food and are among the most vulnerable to the effects of global warming. If the territorial waters of these countries cease to be productive, their inhabitants are largely threatened by hunger.

THE SEA AND OCEANS ARE A FOOD SOURCE FOR BILLIONS OF PEOPLE IN THE WORLD

CO₂ Concentration in Water



<https://earthobservatory.nasa.gov/features/OceanCarbon>

The seas and oceans are the reason that billions of people in the world can survive. Climate change causes a decline in the productivity of fish, which move in search of better living conditions, making it difficult for fishermen to fish. Scientists predict that each successive degree of warming will reduce global fishing potential by more than 3 million tonnes. The constantly moving fish is the downfall of small businesses, as fishing will not be profitable there. Climate change clearly shows that, unfortunately, global fisheries will be significantly weakened. There will be no wild fish living in the seas and oceans.

PEOPLE ALSO ARE THE PROBLEM FOR FISHERIES

The sea regions on the planet are among the most populated and that is why people also influence the poisoning and chemical changes in the composition of the water. The main problem is tourists who leave tonnes of rubbish on the beaches each year. The large amounts of plastic dumped into the oceans adversely affect the already difficult situation in the aquatic ecosystem. Large amounts of exhaust fumes entering the water, including from fishing boats, uncontrolled and illegal amounts of sewage dumped by factories, as well as fishermen themselves wreak havoc on the seas, where a large amounts of fishing nets are abandoned. In fishing nets, tons of fish are killed each year. Whole fish stocks are killed by pollutants flowing from large factories into the water, and they swim to the beach. Tonnes of plastic that dissolves in the seas changes the chemical composition of not only the water but also the fish that are contaminated by the plastic. Later, people eat this fish, which undoubtedly harms their health.

It is human civilization that must prevent the most drastic changes. Only sustainable resource management, minimizing waste and commercial ecology can improve the situation.



<https://www.polywood.com/blog/polywood-culture/facts-about-plastic-in-the-ocean-2020-update/>

The seas are overfished, which is not conducive to wild fish. Therefore, restrictions are introduced in connection with fishing. Due to their movements, fish should adapt to new conditions related to climate change. However, excessive fishing makes this task difficult for them. The problem is not only excessive fishing; the fish are dying because they are not suitable for adapting to the rapidly changing

chemical and physical conditions in the water. All changes caused by climate change and pollution cause metabolic disorders, lowering the resistance of fish and inhibiting their development and reproduction. Due to overfishing, too many young, still underdeveloped specimens die.

UNSTABLE SITUATION FOR FISHERIES



<https://www.polywood.com/blog/polywood-culture/facts-about-plastic-in-the-ocean-2020-update/ps://blog.csiro.au/mass-fish-deaths/>

In developing countries, where fish are the main source of food, the situation is all the more difficult as the pool of official funds allocated to fisheries support decreased in 2010-2015 by almost a third. If natural catches continue to decline, island and developing countries could lose up to 70% of their revenues due to reduced catches. Projected fishery revenues for 2050 foresee a decline of up to 35% if high CO₂ emissions continue to occur. The problems with fishing in developing countries can lead to hunger and even millions of people out of work.

Global warming will also reduce fish availability in European countries. About 70% of the consumed marine products in Europe are imported, so sustainable fishery management is very important. Scientists, however, are hopeful and assume that sound management can lead to positive results. This management includes rational resource management, reducing the amount of waste, reducing CO₂ emissions into the atmosphere, and switching to organic farming. It only gives a glimmer of hope. Scientists estimate that if full adaptive management on a global scale is adopted by 2100, the fish biomass could increase by up to 60%. If half of the management strategies were implemented it could be increased by 34%, and therefore profits would be 154%

higher. For this to happen, however, it is necessary to slow down and control global warming, which is becoming more and more difficult to do. The benefits of this progress would be an increased fish population, obtaining more food from marine sources, and thus a higher business income.

If no action is taken in the field of sustainable fisheries and counteracting climate change, it will lead to a drastic decrease in the productivity of fisheries and negative consequences for both people and the environment.

As the fish move in directions where the water is cooler and more oxygenated, this creates new opportunities for fishermen in the North Atlantic and Pacific regions. This is where fisheries can start to develop at a high level, on one essential condition: only sustainable fishing should be considered.

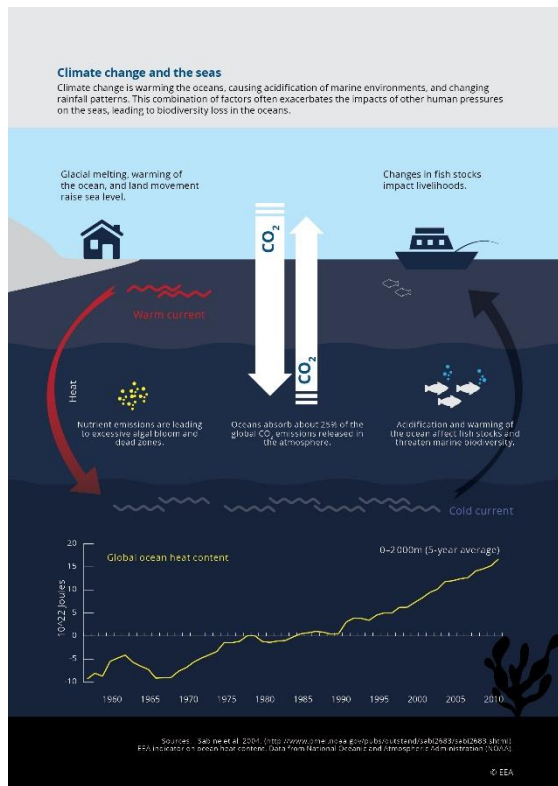
Due to global warming and water pollution, Swedish scientists believe that by 2098 the cod population in the Baltic Sea will suffer significant losses. Herring or sprats will probably be extinct. Due to global warming, the Baltic Sea is losing its salinity, which unfortunately is not conducive to cod. These fish are forced to migrate to the North Sea. As a result, the Baltic may be deprived of the cod.

Portuguese scientists are convinced that global warming will lead to the complete extinction of eel in Europe. Additionally, according to Norwegian scientists, global warming will lead to a reduction in the food for salmon in the sea, which will lead to a reduction in the number of this species. Another example is that since 2007, rapid changes in the distribution of mackerel have also been noticed. These are all changes in fish populations that are a result of climate change.

WHAT ELSE THREATENS BUSINESS FOR FISHERIES

An alternative to the constant consumption of fish are large-scale fish farms. Fish and marine organism farming is the most expanding production sector worldwide. Already today, more than half of the consumed fish comes from fish farming. It is the fish farming business that gives people a lot of opportunities. Farming companies create new jobs and provide food. This is another branch

of the economy that produces food, and this in turn has a negative effect on the natural environment. Farming is also competition for the still existing fishing sectors.



<https://www.eea.europa.eu/media/infographics/climate-change-and-the-seas/view>

As changes in global warming are also noticeable in farms, namely for feeding fish in farms, feed produce from wild fish is used. This means that there is still room for other forms of fishing, not just fish farms. Large amounts of fishing from marine environments are still needed. Already today, very large quantities of farmed fish are exported to poorer countries and this business is growing faster and faster. However, farmed fish differs in a completely different protein composition than wild ones. Therefore, it should be ensured that this one wild fish is mainly eaten.

Research on greenhouse gas emissions for wild fish has shown that for every kilogram of fish caught, 1 to 5 kilograms of CO₂ is emitted. This is better than the production of red meat, for which 50-70 kilograms of CO₂ are emitted for every kilogram of meat.

How the fishery business will operate in the era of constantly advancing global warming is questionable. It depends primarily on how people will care for the environment and the quantity of greenhouse gases emitted into the

atmosphere, as well as the extent to which the amount of waste is limited. Global warming is undoubtedly adversely affecting the oceans and their wildlife. The fishing business today is already becoming less profitable, for example from large investments intended for the long and long journeys of fishermen in the seas. However, it is good to go into the farmed fish business today, as it is rapidly growing and generating a lot of income.

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