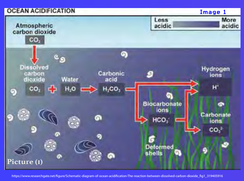
AKADEMIE MODE & DESIGN
Mode · Medien · Management · Design

# OCEAN ACIDIFICATION

## Ocean acidification is often described as the evil twin of climate change (13)

## WHAT IS OCEAN ACIDIFICATION?

Ocean Acidification is part of the happens when seawater absorbs $CO_2$( carbon dioxide) and chemical reactions occur that reduce the pH of marine water, the contraction of carbonate ions and the saturation states of biologically important calcium carbonate minerals. It has been implicated in causing coral reefs to lose their color (an effect known as "coral bleaching"(1)

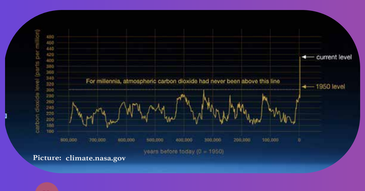


Picture (1)

https://www.researchgate.net/figure/Schematic-diagram-of-ocean-acidification-The-reaction-between-dissolved-carbon-dioxide_fig1_319405916


## HOW DID O.A. START?

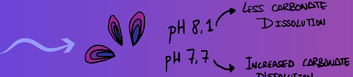
Since the Industrial revolution (1800s), ocean acidification has increased by 30% due to the incrementation of the Co2 that you can see in the picture (Imagen climate Nasa). The gas is produced faster than nature can remove it, which means that the ocean absorbs increasing amounts. In the last 20 million of years this incrementation has never happened that fast (100 times faster) (10)



Picture: climate.nasa.gov

## WHO ARE AFFECTED ?

1.Effect on Calcifying organism and coral : As the ph of the ocean falls, hydrogen ions react with carbonate ions. Calcifying organisms, such as clams, oysters and crustaceans, use the carbonate ions in seawater to make their shells. When calcium carbonate is undersaturated in seawater, their shells may begin to dissolve. Coral skeletons can also be damaged.




2.Effect on food sources and fishing: Calcified organisms are the staple food of many marine animals. A reduction in their population would affect the marine animals that feed on them and thus the fishing industry.

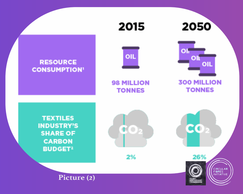
3.Effects on animal chemical signalling: Chemical signals are used by marine animals in their daily life like to detect predators, to reproduce, etc. (4)


4.Also speceies such as reeforming corals, already living at their upper tolerance level, will have more difficulties " moving" fast enought to new areas.

Much of the carbon now in the air will find its way into the ocean with predictable results. "Even if we stopped adding carbon dioxide to the atmosphere today, ocean acidification will continue to increase," says Doney.(9)
Climate.nasa.org

## HOW FASHION INDUSTRY CONTRIBUTE TO O.A.?

Fast fashion industry is constantly producing collections and new clothes at very low prices and generating a consumer education that makes people buy frequently and in large quantities. Indee, most of this clothes end up in the landfill.
The textile industry emits over 1.2 billion tonnes of CO2, more than international flights and maritime transport combined.(5)
93% of man-made warming is absorbed by our oceans and eventually dissolves and has a negative impact on the oceans.



Picture (2)

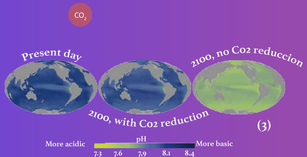
Some points within the Fashion Industry that contribute to O.A. directly & inderectly.

1.Synthetic fibres (polyester, acrylic, nylon etc.) are manufactured with fossil fuels, producing three times more carbon emissions than cotton fibre. Most of the clothes are produced in Bangladesh, India or China and essentially fuelled by coal. This is the dirtiest energy type in therms of carbon emissions. (6)

2.Deforestation contributes to ocean acidification. It is connected to the Fashion Industry, since man-made cellulosic fibres are created by cellulose and are mainly composed of wood derivatives. According to the article written by James Conca in Forbes in 2015, over 70 million trees are logged every year and turned into fabrics like rayon, viscose, modal and lyocell.(7) This translates into, the more trees are cut down, the more carbon dioxide is in the atmosphere. Therefore, ocean absorb more gas, increasing acidity (8)

## THE OCEAN OF THE FUTURE IF WE CONTINUE LIKE THIS

The second map starting from the left shows projected ocean pH levels by 2100 in a possible future scenario in which humans engage in the actions necessary to contain the temperature rise to 2°C during this century, a level of warming that policy makers in many industrialised countries have agreed should be the target to avoid dangerous human influence on the climate
The latest map is based on the idea that humans will not take any action on emissions and our growing population will continue to rely heavily on fossil fuels as a source of energy. (11)




## MITIGATION & ADAPTATION SOLUTIONS

*Government:*
-Government protection: implementation/ actions/solution for mitigate the problem.
-Interaction agreements.
-Accessible information
-More funding for science or organisation that helps the planet.
-Costal protection
-Coral reef recreation
-Increase & Better use of the SDG ( especially 14)

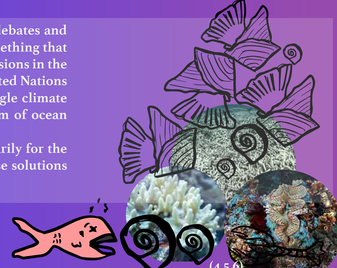
*Citizens::*
-Education about ocean acidification. There are planty of information.
-The use of remanufactured products instead of new ones.
-Chose natural fibers( linene, hemp, ramie)
-In general, reduce your Co2 (e.g. buy less, eat less meat and fish)
-Buy secondhand

*Brand & Companies :*
-Support blue green economy
-Use of renewable energy to produce garments.
-Follow & implement he Circular economy principle and sustainable standards.
-Local production & sales to reduce the CO2 of the transport.



GLOBAL SUSTAINABLE DEVELOPMENT GOALS: The health of the ocean is intimately tied to our health.
Also the drastic reduction in Human activity brought about by Covid-19 may be a changge for ocean to recuperate. (12)
According to UNESCO, the ocean can be an ally against COVID- 19 – bacteria found in the depths of the ocean are used to carry out rapid testing to detect the presence of COVID-19.

Climate change is a concept that has been heard a lot lately, both in the news, political debates and street protests started by Fridays for Future. Ocean acidification, on the other hand, is something that does not seem to carry much attention. It is the result of an overuse of carbon dioxide emissions in the atmosphere, which ends up in the oceans and generates a lot of negative impacts. The United Nations Framework Convention on Climate Change (UNFCCC) cannot be encapsulated by a single climate indicator "ones-size-fits-all". Current emissions targets must be tightened if the problem of ocean acidification and warming needs to be addressed.
People have to be aware that any action taken to tackle environmental problems is primarily for the common good and for the benefit of nature. But not for economic benefits, because those solutions might not be well implemented and/or might not eliminate the problem at all.


(4,5,6)

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4. Andy Brunning/Compound Interst 2017- www.compoundchem.com - https://www.researchgate.net/figure/Schematic-diagram-of-ocean-acidification-The-reaction-between-dissolved-carbon-dioxide_fig1_319405916 (also draws)

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Images:
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SUSTAINABILITY IN FASHION & CREATIVE INDUSTRIES
SUBJECT: ECOSYSTEMS & ECONOMICS
TOPIC: PLANET BOUNDERIES: OCEAN ACIDIFICATION


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