Fishing

1

Today, the fishing industry aims to meet **growing food needs**, as it is the main source of protein for a billion people. The methods used are energy-intensive, both for transport and preservation, and generate almost 180 million tonnes of CO2 per year.

Moreover, the overexploitation of species and the pollution generated by fishing **prevent the natural regulation of biodiversity**. Discarded nets, lines and other fishing gear account for around 10% of all plastic pollution in the oceans.

Sources:
Ocean&Climate Platform," The decline of marine biodiversity"
Seen, "Océans, pêche et impacts environnementaux"
The Weather Channel, "Discarded Fishing Gear is a Major Source of Ocean Pollution, Greenpeace Says"

Industries and Transport

Industries and transports are responsible for air and soil pollution but also light and sound pollution. The industry and the transport account for **more than 50%** of greenhouse gas emissions, aquatic pollution, waste production and global energy consumption, causing the destruction of numerous natural habitats.

In addition, transport also involves the **occupation of natural space** as well as the risk of natural disasters such as oil spills.
However, industry represents more than 17% of global GDP. It is as much an ecological challenge as an economical one.

Sources:
European Environment agency, "le défi de la réduction de la pollution industrielle"
Conseil Européen, "Émissions industrielles"

Tourism

3

Tourism is responsible for **8% of global greenhouse gas emissions** and contributes significantly to the global plastic pollution crisis. Indeed, 8 out of 10 tourists travel to coastal areas.

Marine tourism is responsible for **absurd amounts of waste** in the ocean and is also a source of **stress and communication disruption** for marine mammals.

Sources:
European Environment agency, "le défi de la réduction de la pollution industrielle"
Conseil Européen, "Émissions industrielles"
RTBF actus, "Les bélugas menacés par la pollution aquatique et sonore, notamment du tourisme maritime au Canada"

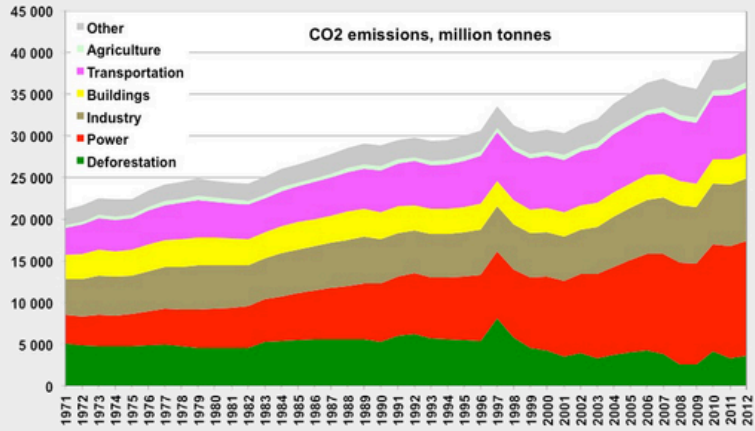
Pollution

Plastic makes up 80% of all marine debris. At least **14 million tons** of plastic (of the 400 produced each year) end up in the ocean every year, causing more than 1.5 million marine animals to die every year, including 100,000 marine mammals. Plastic pollution also destroys habitats and impacts the entire food chain, from plankton to large predators.

Sound pollution is not to neglate too : sound is a very important sensory cue for marine animals, serving absolutely vital functions such as communication between species, reproduction and orientation. **150 marine species are affected** by noise pollution, including 47 mammal species, 66 fish and even 36 invertebrates.

Source:
The SeaCleaners, “marine plastic pollution”

CO2 Emission



Emissions by sector since 1971, F gases excepted, all greenhouse gases taken into account

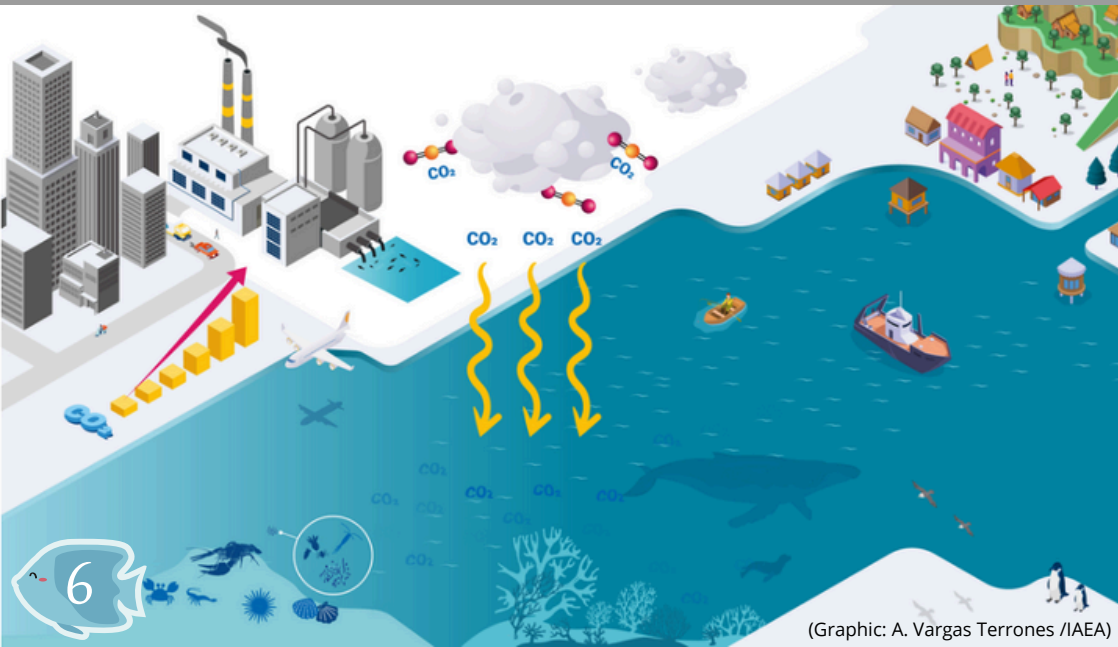
Sources : BP statistical Review 2013 for fossil fuels; IEA for the breakdown of fossil fuel by sector; CDIAC fo lime calcination; Houghton, The Woods Hole Research Center for deforestation; source above for methane, and calculations and extrapolations by the author.

CO2 is the main actor in climate change, and without reducing its emissions, the IPCC reports announces a **rise in temperatures** of up to 5.5°C.

Although energy seems to be the main emitter, it should not be forgotten that part of the energy is intended to serve other emission areas such as transport, industry or food production. It is therefore essential to **act in all areas** in order to reduce CO2 emissions and contrary to certain beliefs, it is the duty of all (and not only of the big polluters) to move forward.

Sources:
Jean-Marc JANCOVICI, "How do greenhouse gas emissions presently evolve**?**"
Climate.be, "Réchauffement planétaire"

Acidification



(Graphic: A. Vargas Terrones /IAEA)

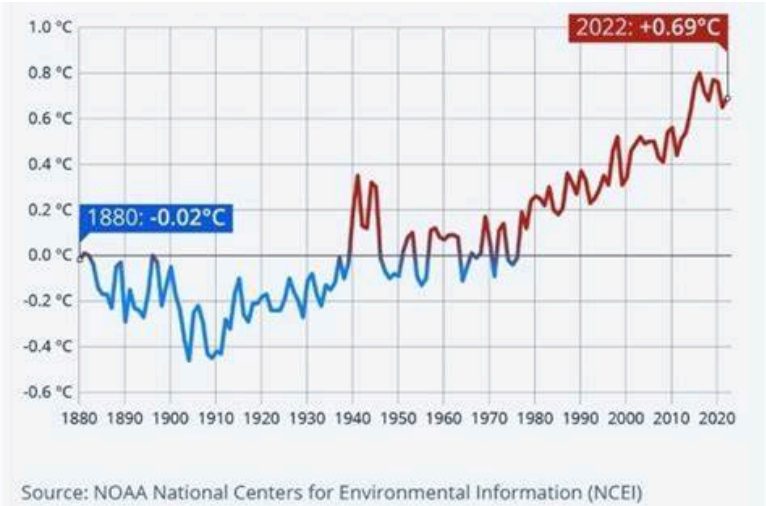
It is estimated that **25 to 30%** of the CO2 is **absorbed by the oceans**. This CO2 is absorbed by dissolving on the surface of the water but also thanks to the phytoplankton present in the water.

As human industrial activity continues to increase, the oceans are now absorbing astronomical quantities of CO2... causing them to **acidify**!

Ocean acidification has a direct impact on marine organisms with a calcareous skeleton or shell: phytoplankton, crustaceans, molluscs... It makes it harder for them to maintain these calcified structures. This can cause **disruptions** within food chains.

Source:
Pimpant, "Acidification des océans : définition, causes, conséquences..."

Rising Sea Surface Temperature



Annual Divergence of global sea surface temperature from 20th century average

CO2 emissions not only heat the atmosphere but also the seas because of the convection at their surface. **Sea surface temperature** has been consistently **higher** during the past three decades than at any other known time in history.

Variations in ocean temperature can affect plant, animal and microbe species and alter migration and reproduction patterns. In the long term, rising sea surface temperatures could also reduce the circulation patterns that bring nutrients from deep waters to surface waters.

Changes in reef habitat and nutrient supply could significantly alter **ocean ecosystems** and lead to **declining** fish populations.

Sources:
The ASEAN Post, "Our Oceans Are Too Hot"
NPJ ocean sustainability, "Good fisheries management is good carbon management"

Exceptional climatic events

According to the IPCC report from 2012, **climate change** may **increase the frequency and severity** of exceptional climatic events to unprecedented levels

These events make **natural environments poorer** and **disrupt marine and coastal habitats** that are crucial for the reproduction and survival of certain species.

Sources:
Plateforme Océans & Climat, "La biodiversité marine en déclin"
Greenpeace, "Changement climatique et événements climatiques extrêmes dans le monde"

Disturbance of marine habitats

It is estimated that **90% of marine** species reproduce along the **coast**.

However, today's **marine habitats**, including coastlines, are **threatened** by a number of factors. While exceptional climatic events can cause temporary disturbances in marine ecosystems, the greater and more persistent impact stems from global warming due to human activities.

Because of these disruptions in habitats, some species **migrate**, others **perish**, while some become **invasive**.

Sources:
European Environment Agency, "How Climate change impacts marine life"
Planète mer, "Des dérèglements rapides aux impacts globaux"

Migration of marine species

Faced with changing environmental conditions and rising sea temperature, **certain areas** are gradually becoming **uninhabitable for fish**, triggering numerous abnormal migrations.

Some species adapt to changes, while others **migrate** to the poles or to new areas.

As a result, the entire traditional distribution map of fish populations is altered, leaving certain areas devoid of the usual fish populations and causing numerous **shortages**.

Source:
Ifremer, "Des populations de poissons perturbées par le changement climatique"

Endangered species / Invasive species

Due to the destruction of their habitats, many marine species are under threat. Today, we're talking about another **man-made mass extinction**. According to IPCC reports, if global warming exceeds 3 degrees, **87% of marine species** will be threatened with extinction.

Moreover, as habitats are disrupted, other species take over from native species and become **invasive**. These species thrive because their new habitat lacks the natural predators to control their population. They cause damage mainly by consuming native species, competing with them for food or space, or introducing diseases.

Sources:
Futura sciences, "La quasi-totalité de la vie marine est menacée d'extinction d'ici 2100"
UICN,"Les activités humaines dévastent les espèces marines, des mammifères aux coraux - Liste rouge de l'UICN"

Solutions

Today, numerous **government initiatives** are being launched to preserve the marine ecosystem, such as the "zero plastic waste at sea" plan established in 2020.

However,given the urgency of the situation, it's up to **each and every one of us** to help protect marine habitats by respecting ecosystems anytime and anywhere.

Sources:
National Ocean Service, “How can you help our ocean?”
Marina Vela, “Préserver l’Écosystème Marin : quelles Actions mener ?”

Fish Shortages

Fish populations that is essential for food and jobs have **crashed by 50%** in the last 4 decades.

In fact, **overfishing and degradation of marine habitats** are threatening **fish resources**, one of the main sources of food for the world's population, especially in developing countries and coastal regions.

Sources:
WWF, "Failing fisheries and poor ocean health starving human food supply – tide must turn"
Division des sciences et de la technologie, "Les pêches dans le monde: l'état de crise", Alan Nixon