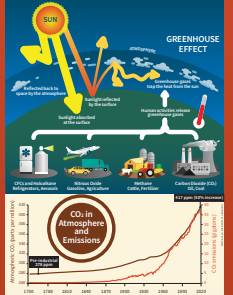




## CO<sub>2</sub> HEATS OUR PLANET

Over the last 150 years, our burning of fossil fuels has increased the greenhouse gases in our atmosphere. One of these is CO<sub>2</sub>. More gases create a stronger greenhouse effect, trapping more heat and changing our climate.



### CLIMATE CHANGE IS ALREADY IMPACTING HUMANS

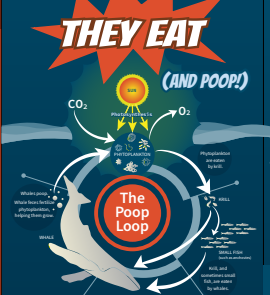


**What Will Fix It?**

- STOP ADDING GREENHOUSE GASES**
  - Some nations are promising to reduce CO<sub>2</sub> and other greenhouse gas emissions. They agree that these will help to stabilize the climate.
  - The 2009 Kyoto Protocol aims to cut greenhouse gas emissions by 55% by 2012.
  - The 2015 Paris Agreement calls for limiting the global average temperature rise to 2 degrees Celsius above pre-industrial levels.
  - The 2015 COP21 Climate Agreement seeks to protect forests, reduce methane gas and limit use of coal and oil.
  - Scientists are working to find the best way to keep the temperature rise to just 1.5 degrees Celsius.
- REMOVE EXISTING GREENHOUSE GASES**
  - Some scientists are creating machines to pull CO<sub>2</sub> out of the atmosphere. We haven't been doing that for millions of years. Companies are now testing the first commercial-scale machines to remove CO<sub>2</sub> from the air.
  - Some scientists are also developing ways to capture carbon and use it to grow plants and trees. They capture carbon and use it to grow plants and trees.

## WHALES COOL OUR PLANET (ONE CO<sub>2</sub> MOLECULE AT A TIME)

### HOW DO THEY DO IT?

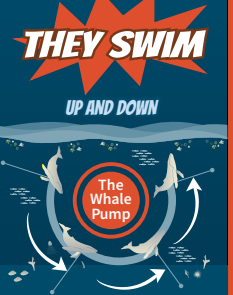


Just like every other whale, whales eat and poop. Their poop richly fertilize microscopic marine algae, called phytoplankton. These phytoplankton are eaten by tiny animals called zooplankton. And zooplankton is eaten by small schooling fish and also whales. After the whales have eaten, they poop some more, and the cycle starts again.

More whales lead to more phytoplankton, which use photosynthesis to remove more tons of CO<sub>2</sub> from the air. This helps to stabilize our water planet.

**PHYTOPLANKTON: TINY SUPERHEROES**

Every other breath we take is a gift from the sea. Over half of our oxygen comes from phytoplankton. Through photosynthesis, these tiny marine algae absorb CO<sub>2</sub> and capture energy from the sun to store as carbohydrate. In the same time, they produce releases oxygen. The phytoplankton in the ocean create as much oxygen as all the forests and plants on land!

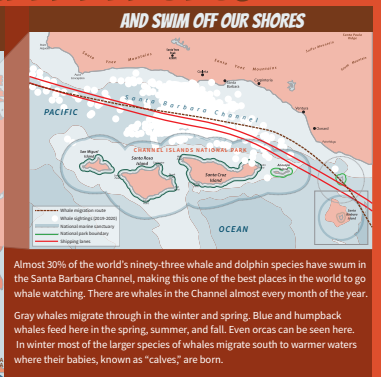


**AND ALL AROUND**

Whales also swim thousands of miles from waters near the poles to waters near the tropics. These migrations distribute nutrients even further.



# WHALES ARE SUPERHEROES!



Almost 30% of the world's ninety-three whale and dolphin species have swum in the Santa Barbara Channel, making this one of the best places in the world to go whale watching. There are whales in the Channel almost every month of the year.

Gray whales migrate through in the winter and spring. Blue and humpback whales feed here in the spring, summer, and fall. Even orcas can be seen here. In winter most of the larger species of whales migrate south to warmer waters where their babies, known as "calves," are born.

### About Whales

Like us, whales are smart, playful, social, and curious, with many cultural traditions.

**THEY DIE**

**The Whale Fall**

The International Monetary Fund (IMF) estimates that whales have the potential to capture 1.7 billion tons of CO<sub>2</sub> annually, if we allow them to restore to their pre-whaling numbers.

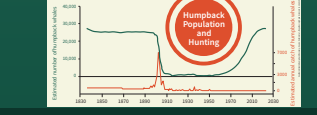
When a whale carcass falls at the end of the deep ocean floor, its carbon stays there, far from our atmosphere, helping to counteract climate change.

Within days, scavengers feast on the carcass. Most live near the bottom of the sea, keeping carbon sunk in the ocean.

Some whales are the largest animals ever to have lived on Earth. Baleen and sperm whales are among the biggest, known collectively as the "great whales."



## PROTECTING WHALES PROTECTS OUR PLANET



While natural whale deaths help the ecosystem, industrial whaling hurt it. During the 1800s and 1900s, hunters wiped out whale populations. Only 5% of humpback whales remained; and only 1% of blue whales.

Today, biologists, resource managers, and citizen scientists work together to protect all whales. Saving these superheroes ensures a safe and healthy planet for all of us.



Protects in the early 2010s led to regulations that set limits on whaling. Today, only a few nations still hunt whales commercially. Some nations people continue to hunt whales for food, especially in the Arctic. In many areas around the world, whale hunting has been replaced by whale watching.

Whales must migrate among other human threats besides hunting. Whales suffer from illegal plastics and oil spills. Green also get tangled in commercial fishing gear to be by large cargo vessels, either of which can kill them.

There is scientific proof that whales are important to the health of the planet. We now understand that we owe them our attention and protection. Restoring whale populations to some of the many ways we can address climate change. By helping them, we are also helping ourselves.