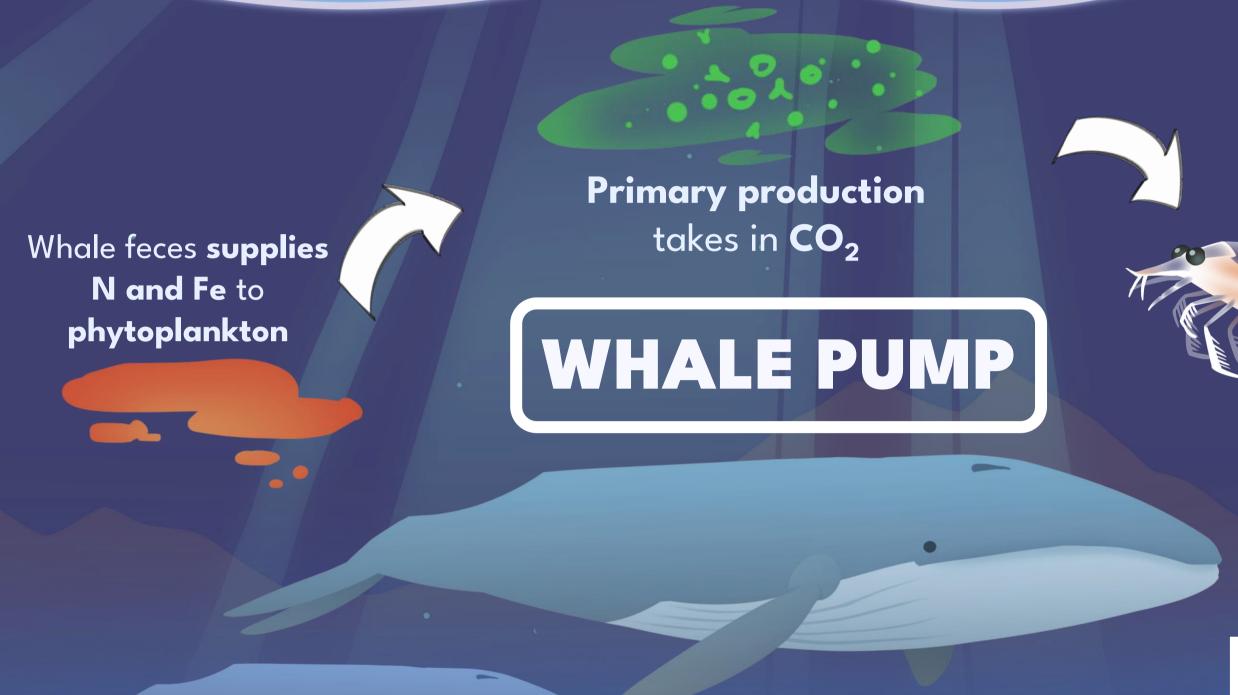
# MPACT OF WHALES ON CLIMATE CHANGE



Whales consume krill and metabolize N and Fe

### Living whales

- Whales contribute to ocean carbon sequestration primarily by
- stimulating primary production
- They **increase** the availability of limiting **nutrients** according to two dynamic principles:
  - The whale pump
  - The whale conveyor belt

### **Dead whales**

- their lifetime
- years

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Krill feeds on phytoplankton and thus is **rich in N and Fe** 

### **CONVEYOR BELT**

Great whales store carbon equal to around **33 tons of CO**<sub>2</sub> throughout

- During a **whale fall**, that carbon is **removed** from the surface carbon cycle and **stored** in ocean floor sediments for 100s to 1000s of

**Metabolized nutrients** stored **during** migration are released in **oligotrophic** tropical waters

A single whale skeleton can **host** up to **185** species!



Live oak trees capture **12 tons** of CO<sub>2</sub> across their lifespan (500 years) on average!

## **Climate Change** implications

- Whale falls role in global sequestration is **miniscule** - The whale pump and conveyor belt are **crucial system** drivers for sustainability

- Southern sperm whales alone (12 000 individuals) stimulates at least **400 000** tons of carbon

sequestration annually Depleting whale populations could have **unforeseen**, irreversible consequences for global carbon sequestration due to whales' role in the nutrient cycle

