

**Phytoplankton**

Plants of the sea are also called phytoplankton. The sea does not have coral reefs which keep the sea stable in which other organisms live there.

Great White sharks and Gags for seals. The shark attacks and eats the seals which keeps the population stable with the seals high reproduction rate.

**Density Dependent**

Factors: Food availability, Disease, Wrecking disease in salmon.

**Density Independent**

Factors: Climate Extremes Example - Droughts & storms.

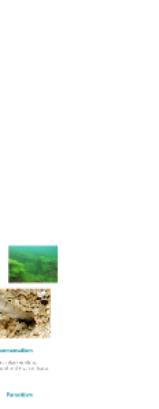
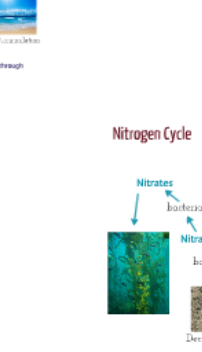
**Limiting factors**

Factors: Food availability, Disease, Wrecking disease in salmon.

**Biological Magnification**

In the marine ecosystem an example of biological magnification is the Mercury accumulation in humans that eat a lot of tuna fish.

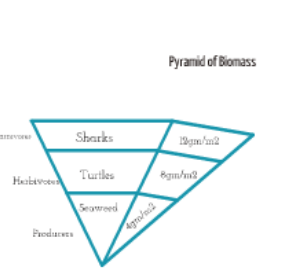
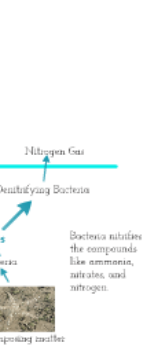
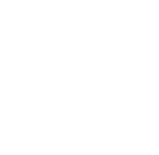
Mercury can enter the environment in many ways such as an urban sewage system, and contamination, a coal-fired power plant, and deposition from the atmosphere. So then it is released into streams and other water bodies, which it is then diffused into the water and the fish intake the toxins.



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**Impact of Pollution**

The impact of air pollution can cause acid rain. It can acidify the water and cause coral pollution. It can also cause the death of marine life.

**Biodiversity**

In the marine ecosystem biodiversity is high. It is the variety of life forms in the ocean.

**Impact of Water Pollution**

Oil spills cause water pollution and the effect of it is that many birds, fish, and whales die or become sick. This is because of the toxic chemicals in the oil.

**Over Fishing**

Over fishing can result in the depletion of fish stocks and can lead to the collapse of the fishery. This is because fish need time to reproduce and grow.

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**Climate Change**

Climate change is caused by the greenhouse effect. It is the warming of the earth's atmosphere by the greenhouse gases.

**Impact of Non-Native Species**

Non-native species can harm the environment. They can compete with native species for resources and can spread diseases.

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**Succession**

When a shark dies and its body is decomposed, it releases nutrients into the water. These nutrients are used by other organisms to grow and reproduce.

**Secondary Succession**

When a natural disaster occurs and wipes out the resources in a given area, it can lead to secondary succession. This is when the area is repopulated by organisms that were already present or that came from elsewhere.

**Carbon Cycle in the Ocean**

The carbon cycle in the ocean involves the exchange of carbon between the atmosphere, the land, and the ocean. It is a complex process that involves many different organisms and processes.

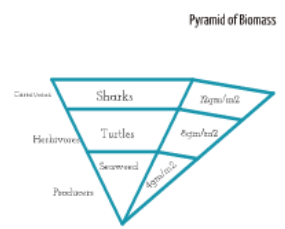
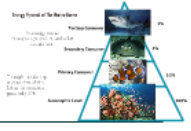
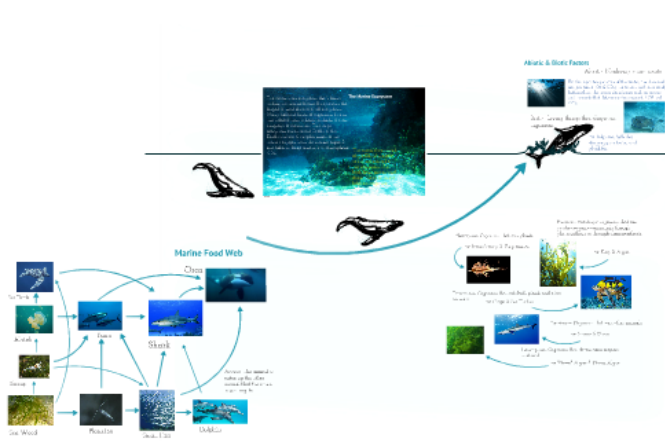
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Sarah Ponder 3/7/13

Fair-Mead Marine

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**Protein Polarity**  
The size of the amino acid side chains affects the polarity of the protein. Large side chains are hydrophobic, while small side chains are hydrophilic.

**Limiting Factors**

- Density Dependent:** Factors like food availability, predation, and disease that change as the population density increases.
- Density Independent:** Factors like natural disasters (earthquakes, tsunamis) that affect the population regardless of its density.

**Biological Magnification**

-Is the increasing concentration of toxic substances within each successive link in the food chain.

In the marine ecosystem an example of biological magnification is the Mercury accumulation in humans that eat a lot of tuna fish.

**Impact of Air Pollution**

Transport of air pollution can occur over long distances.

From roughly the north and south poles, air pollution can be transported to the equator.

**Climate Change - Warm Oceans**

Warmer oceans will have less oxygen available to marine life.

Many species will be unable to migrate as they are unable to move through the warm water.

**Impact of Non-Native Species**

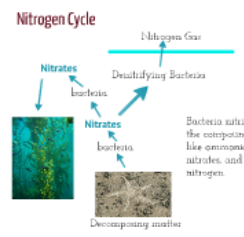
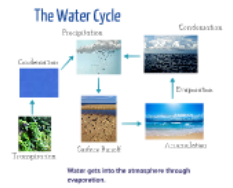
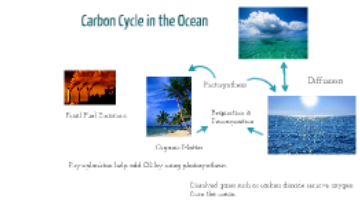
An example of a non-native species is the human.

The impact of humans on the ocean is the over-fishing and the polluting of the ocean with trash.

**Succession**

**Primary Succession**  
When a shark runs out of resources in a given area and swims all to find a new area with an abundant resource. A pioneer species of this is the Frickly shark.

**Secondary Succession**  
When a natural disaster occurs and wipes out the resources in a given area. After an amount of time, it will regrow and fish and other sea animals will return. A pioneer species can be small fish.



**Biodiversity**

Is the measure of variation from one kind of biodiversity.

**Species:** The number of all the fish species that live in the ocean.

**Impact of Water Pollution**

Oil spill causes water pollution and the effect of it is that many birds, fish, and whales die because their food sources are destroyed.

**Over-Fishing**

Over-fishing is the removal of fish from the ocean faster than they can reproduce.

**Limited Protection**  
While limited fishing is not all the answer, protecting the reproductive cycle is important.

**Pollution**  
Oil spills, heavy metal, and other pollutants affect the reproductive cycle of many species.

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# Fair-Mead Marine

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# The Marine Ecosystem

The ocean is an ecosystem that's found within the marine biome. It represents the largest & most diverse of all ecosystems. Many different kinds of organisms live in this habitat, from whales to sharks & from stingrays to clown fish. This large ecosystem covers about 3/4ths of the Earth's surface & supplies much of the world's oxygen from the marine algae & and takes in large amounts of atmospheric CO<sub>2</sub>.

The ocean covers most of the Earth's surface so it surrounds all of the continents, is in both hemispheres, and doesn't have an exact latitude/longitude.

Herbivores- Organism that eats plants.

Ex. Brine Shrimp & Zooplankton



Producer- Autotrophic organism that can produce organic compounds through photosynthesis or through chemosynthesis.

Ex. Kelp & Algae



Omnivores- Organism that eats both plants and other animals.

Ex. Crabs & Sea Turtles

Carnivore- Organism that eats other animals.

Ex. Sharks & Orcas



Decomposer- Organism that decomposes organic material.

Ex. "Green" Algae & Ocean Algae



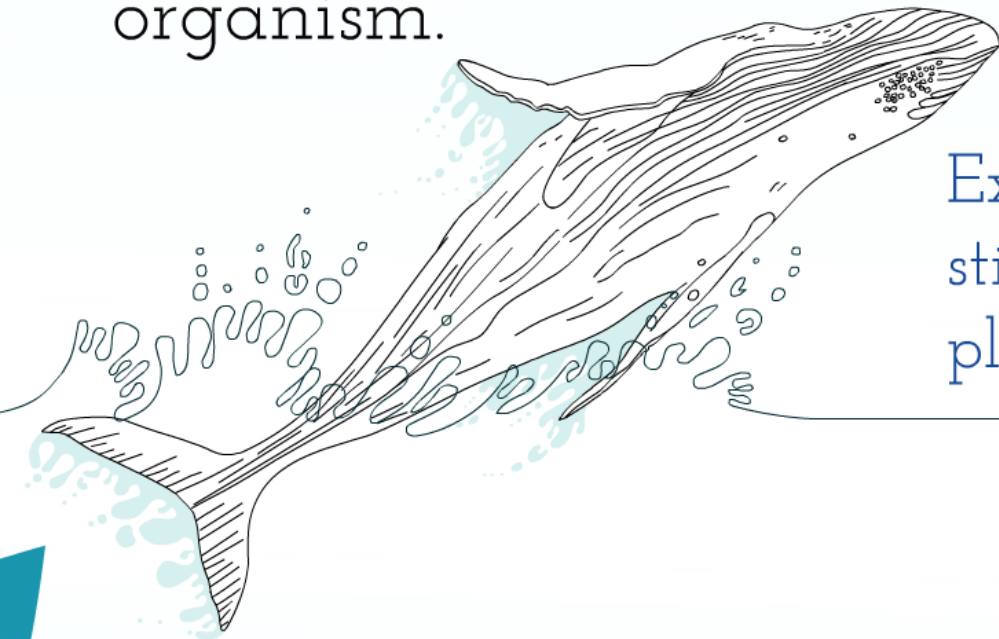
# Abiotic & Biotic Factors

Abiotic- Nonliving components.



Ex. Sunlight, temperature of the water, the chemical composition of  $O_2$  &  $CO_2$ , the terrain such as a sandy bottom floor, the water disturbance such as waves and currents that determine the amount of  $O_2$  and  $CO_2$ .

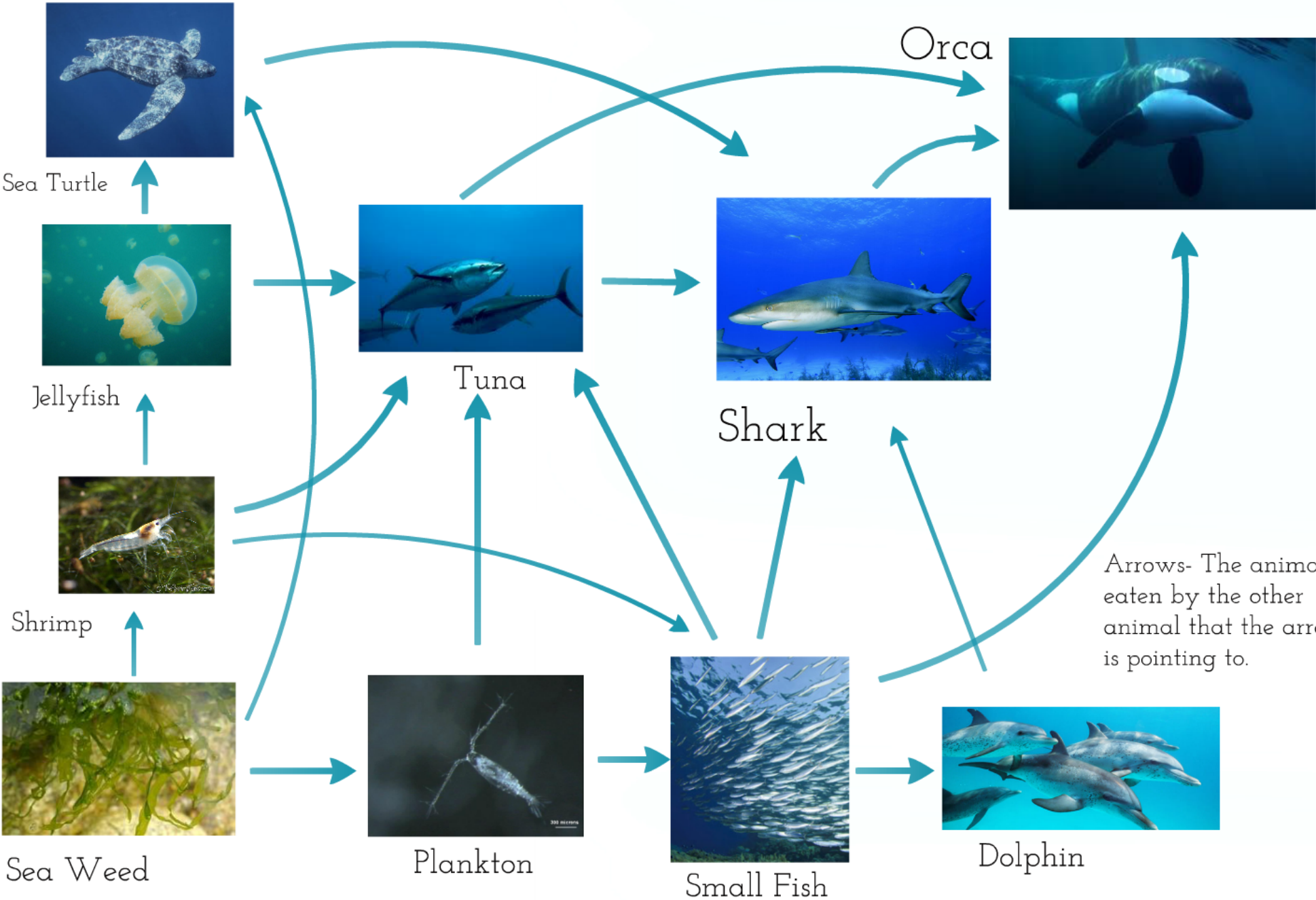
Biotic- Living things that shape an organism.



Ex. Dolphins, Whales, stingrays, bacteria, and plankton.



# Marine Food Web



Arrows- The animal is eaten by the other animal that the arrow is pointing to.

## Predator-Prey Relationships

Crown-of-thorns sea star and coral polyps.  
The Sea Star eats the coral polyps which  
keep the coral stable in which other animals  
can live there.

~k strategist



Crown-of-Thorns  
Sea Star



Great White  
attacking seal  
Video

- Great White sharks and Cape Fur seals.

The shark attacks and eats the seals which keeps  
the population stable with the seals high  
reproduction rate.

~k strategist (shark)

~r strategist (seal)

# Energy Pyramid of The Marine Biome

As energy moves through a pyramid, it can be lost through heat.

Through transferring energy, 90% of it is lost so the organism gains only 10%.

**Autotrophic Level**

**Primary Consumer**

**Secondary Consumer**

**Tertiary Consumer**



1%

1%

10%

100%