

Welcome to the Abyss

The Abyssopelagic Zone

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What is the abyss?

- Deepest part of midnight zone
- No currents and receives no light (aphotic) apart from bioluminescent animals
- Makes up 60% of the Earth and 85% of the ocean
- Filled with creatures that can sustain in extremely high pressure
- the fourth layer down just above the Hadal zone
- Lies partially in the dysphotic and aphotic zones



Epipelagic Zone

200m

Mesopelagic Zone

1000m

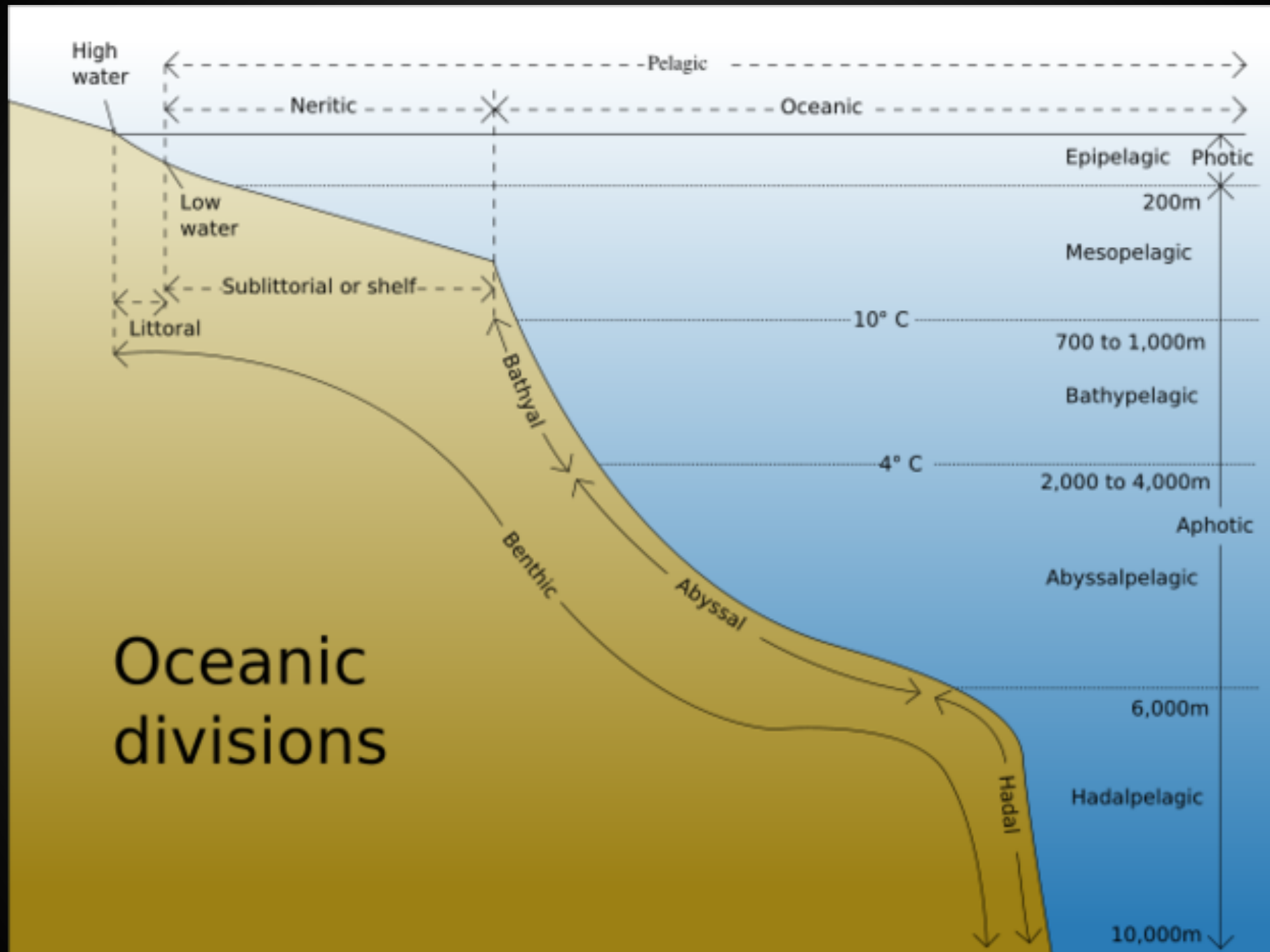
Bathypelagic Zone

4000m

Abyssopelagic Zone

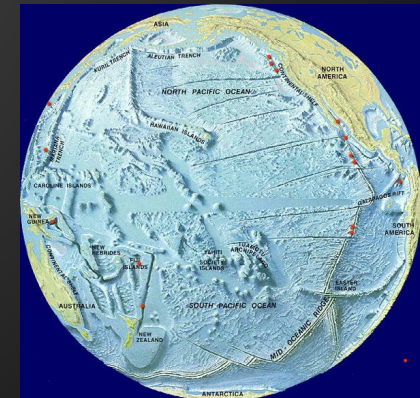
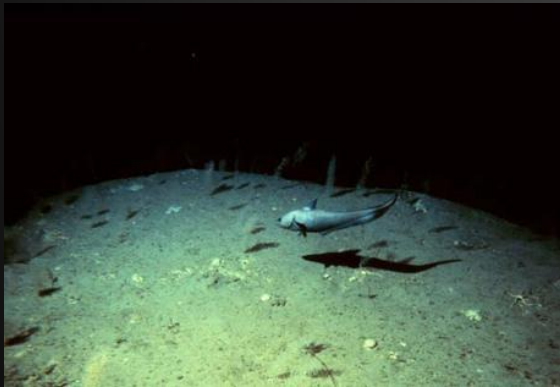
Basic Info

- Depth- 4,000-6,000 meters
- Temperature- 2-3 degrees Celsius (35-37 fahrenheit)
- Salinity- 34.6-35 ppt
- Pressure- 76 megapascals
- Oxygen- High Oxygen content



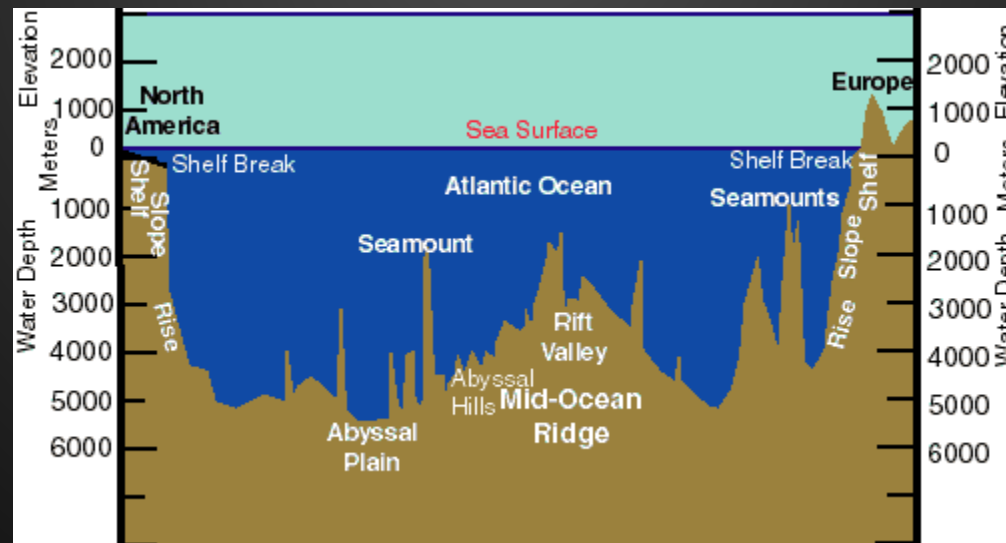
Abiotic Factors

- Physical characteristics
- Hydrothermal Vents
- Abyssal Light



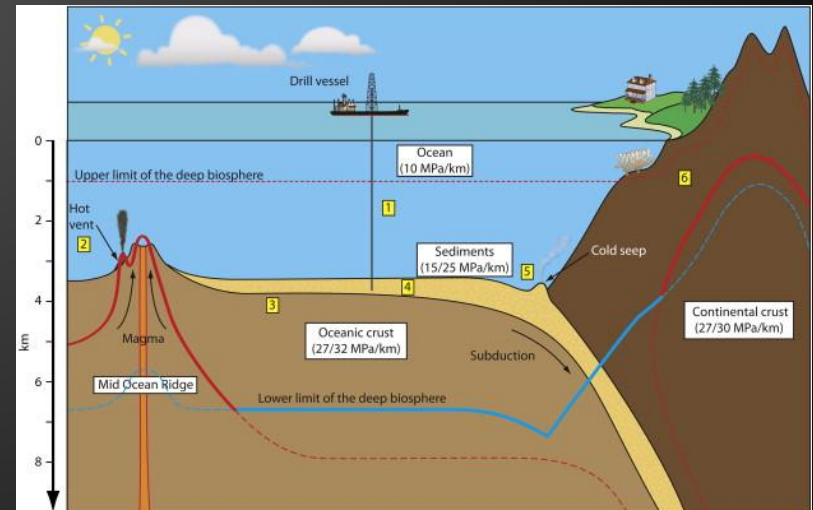
Physical Characteristics

- Abyssal Hills: low hills on ocean floor; series of parallel ridges
- Abyssal Plains: flat areas of the deep ocean floor; small slopes (made of sediment, volcanic ash, and chemical precipitates)
- Seamounts: isolated mountains
- Mid-Oceanic Ridges: center of rift valleys (includes volcanoes that make up the islands above water)



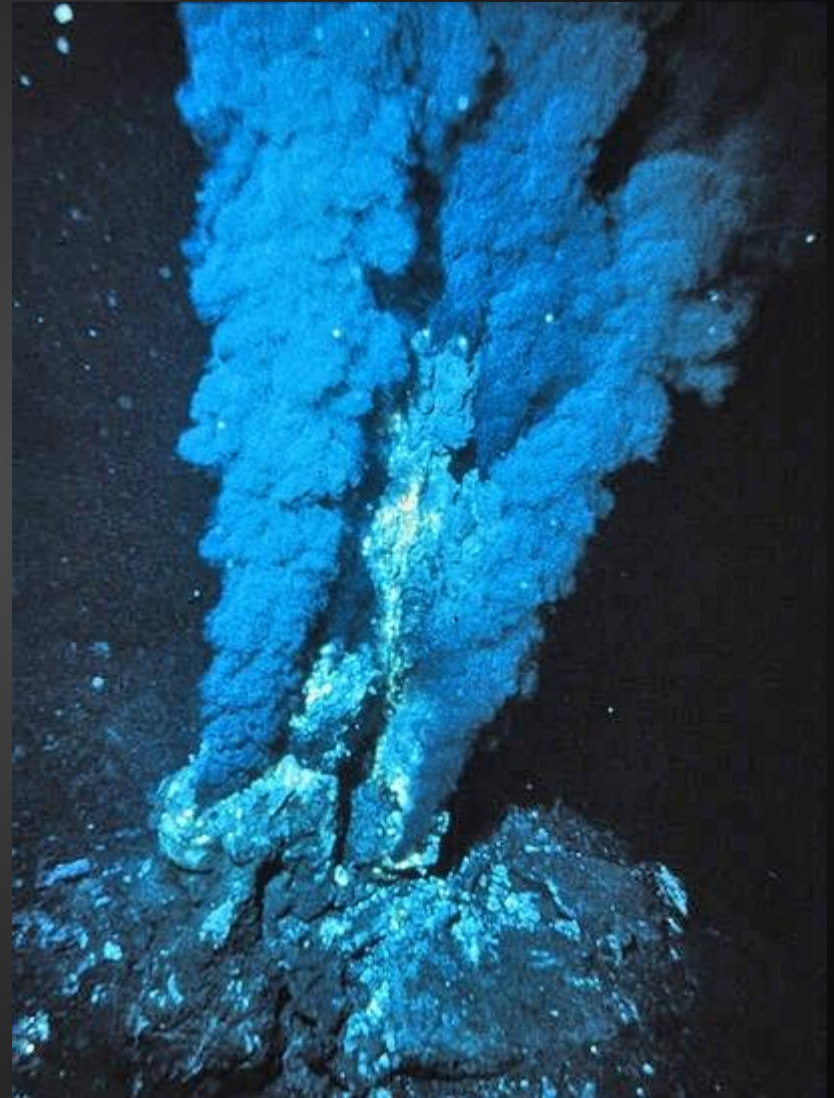
Vents

- Hot springs in rift valleys
- Black Smokers-
Hydrogen Sulfide
- Breeding Places-High
nutrient content
(chemosynthesis)
- Mineral-containing water
also causes "light"



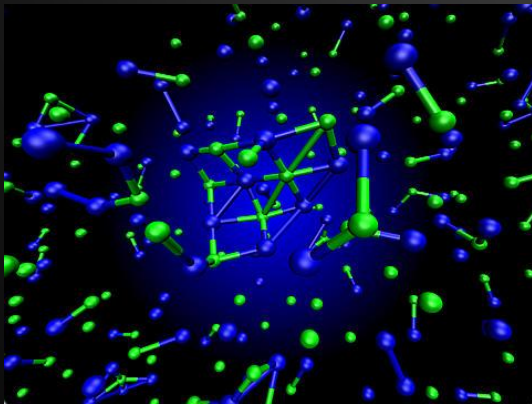
Abyssal Light

- No sunlight=no visible light to the human eye
- Light from vents that animals are enabled to see.
- Ridge top vents release heated water (contains high amounts of minerals)
- High temperature water surrounded by very low temperature water



Abyssal Light

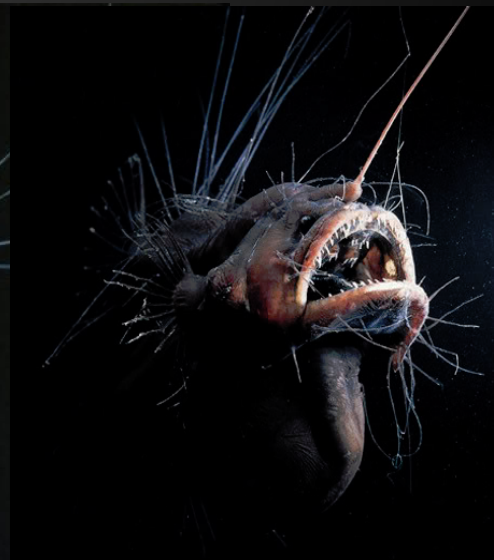
- Crystalloluminescence: hot water contacts cold water. Minerals dissolve and crystallize
- Triboluminescence: mineral crystals crack in cold water and bond together in the turbulent water, causing light.
- "light"=home for animals



Animals of the Abyss

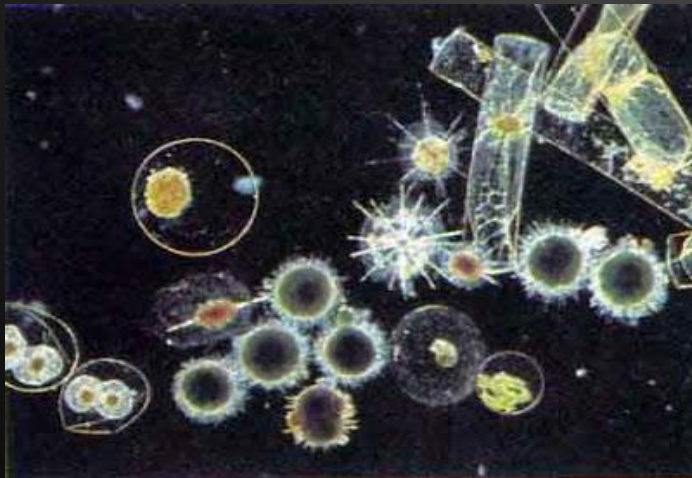
In order to survive the harshness of the abyssopelagic zone, organisms have grown adaptations to their environment. Several of these adaptations make residents of the abyss very unique.

Examples of these adaptations are blindness to semi-blindness due to the lack of light, bioluminescence, and a slow metabolism.



The Basis of Life; Primary Producers

- Primary producers are microorganisms and include the large group of phytoplankton
- Most primary producers surround hydrothermal vents and use chemosynthesis to survive due to the lack of light.
- These primary producers are the very beginning in the food chain and are fed upon by "small crustaceans, which in turn are eaten by a variety of predators including crabs, shrimp, snails and bivalves" (<http://www.brighthub.com/environment/science-environmental/articles/60013.aspx>).

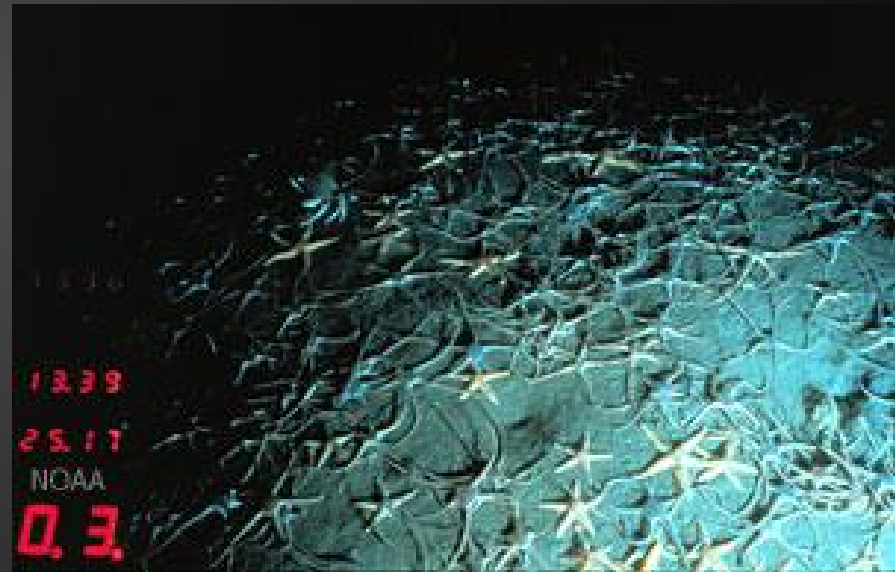


Can You See Me? Invertebrates

One form of organism that survives in the abyssopelagic zone is invertebrates.

An example of an invertebrate that lives in the abyss is a basket star. This organism is part of the phylum echinodermata, meaning that it exists exclusively in the ocean and is divided radially.

The basket star arm span can grow to 25 cm in length and feeds on the detritus that eventually floats to the ocean floor, an adaptation to the limited amount of food in the abyss.



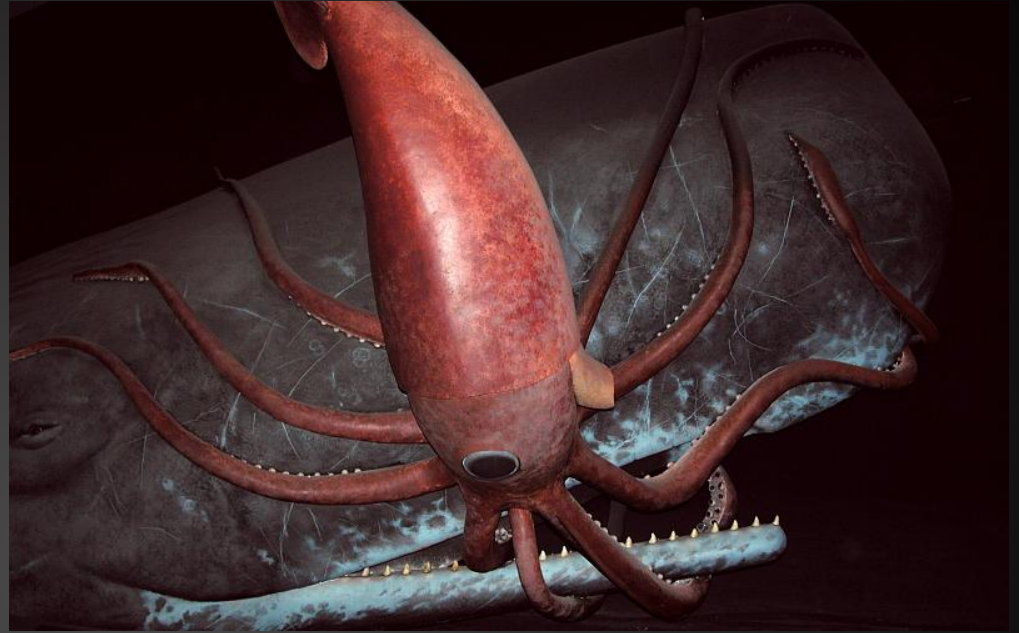
Invertebrates II.

The sea pig, or scotoplanes, is another echinoderm that resides in the abyssopelagic zone. This creature is a deposit feeder, meaning that it finds food by digging through the sand and debris at the bottom of the ocean to find organic particles. This form of scavenging is how the sea pig has evolved to the scarce amount of nutrients that reach the depths of the abyssopelagic zone.



GIANT SQUIDZ

- live partly in the abyssal layer
- freaking awesome
- they battle sperm whales



Crustaceans Live Here Too!

Another type of animal that lives in the abyssopelagic zone is crustaceans.



One crustacean that inhabits the abyssopelagic zone is the sea spider. These animals can grow up to 35 inches, or 90 cm. In order to survive the pressure of the deep, sea spiders have no respiratory system, experiencing gas exchange through diffusion instead.

Also features a special appendage called the proboscis for feeding.

Crustaceans II.

Deep Sea Shrimp are a second crustacean of the abyssopelagic zone. These shrimp have adapted to the lack of light of the abyss by having light-sensitive patches on their dorsal side. This patch makes it so that they are able to see in the little light created by the heated water near ocean floor vents.



Creatures of the Deep; Vertebrates

- typically small, black or red colored
- often transparent
- primarily the Blackdevil Angler

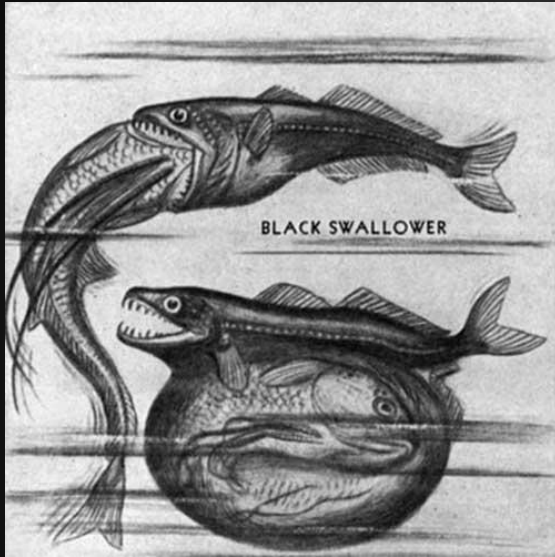
RAWRRRRR

I've adapted to life in the abyssopelagic zone by utilizing bioluminescent bacteria to attract prey in this lightless environment! Imma eat yo family!



Other vertebrates

black swallower



tripod fish



Bibliography

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