

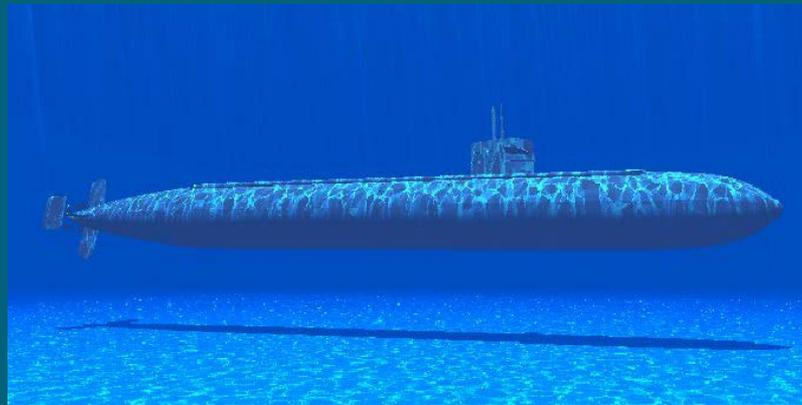
OCEAN ZONES

ZONES OF THE WATER COLUMN

We are looking DEEP into
the ocean...

So deep in fact that it takes HOURS to free fall to
the bottom!

The ocean is much, much deeper than anything on
land is high...(NOW THAT'S DEEP!)



Did you know?



- There is still much we don't know about the ocean depths that makes being a scientist in this exciting field such an adventure.
- New creatures are still being discovered every day!
- There are more species in the ocean than there are on the entire surface of the land...

There are.....3 Zones!

- What is a zone?
- Can you think of a synonym?

Why are there different zones?

- Scientists have organized the sea into layers/zones because the living environment generally changes with each different layer.
- Each layer is usually distinguished by the amount of sunlight it receives, the depths it occupies, temperature, salinity, and the degree of water pressure found there.

Let's suit up!!

- Put on your diving gear! We are going down to the deepest depths of the ocean....



Our first stop along the way...

SURFACE ZONE

- From the surface to about 200 meters down...
- As you begin your dive you see that the ocean is filled with life forms of every sort. From the microscopic plankton, to bony fish of every shape and size, to sea stars and warm-blooded, oxygen-breathing mammals. You can see the most fantastic array of colors: reds, pinks, purples, bright yellows, oranges, blues, greens

On the top....

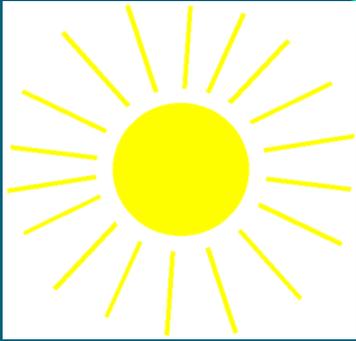
Warm!

Surface Zone

• 200 m



SURFACE ZONE



- Remember, the sun is shining down on the surface of the ocean. This provides two things for the water there.



- 1) Heat
- 2) Light - energy organisms use to make food

SURFACE ZONE

- This allows producers that use photosynthesis to grow here.

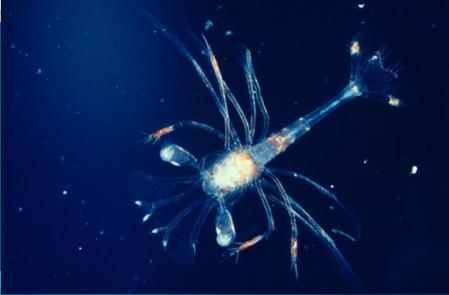
- Kelp
- Seaweed
- Algae



- MOST OF THE LIVING THINGS IN THE OCEAN LIVE HERE!

SURFACE ZONE

- Lots of animals live here:



SURFACE ZONE

- Temperature: 64 °F
- Salinity: Highest concentration of Salt (NaCl). Why?
LOTS AND LOTS OF SALT!
- Water Pressure: Least amount of pressure...
 - why?
 - Could you scuba dive here?

TRANSITION ZONE

In the Middle...

- As you dive deeper in the sea, you will quickly notice the effects of water pressure on your body. The deeper you dive the more water is over the top of you. The greater the volume of water between you and the surface of the ocean, the greater the pressure on your body.
- You also notice that there is remarkably less light here. It's getting much darker.
- Producers have a hard time— no light for photosynthesis.

In the middle...

Warm!

Surface Zone

• 200 m

Cool

Transition Zone

• 1 km

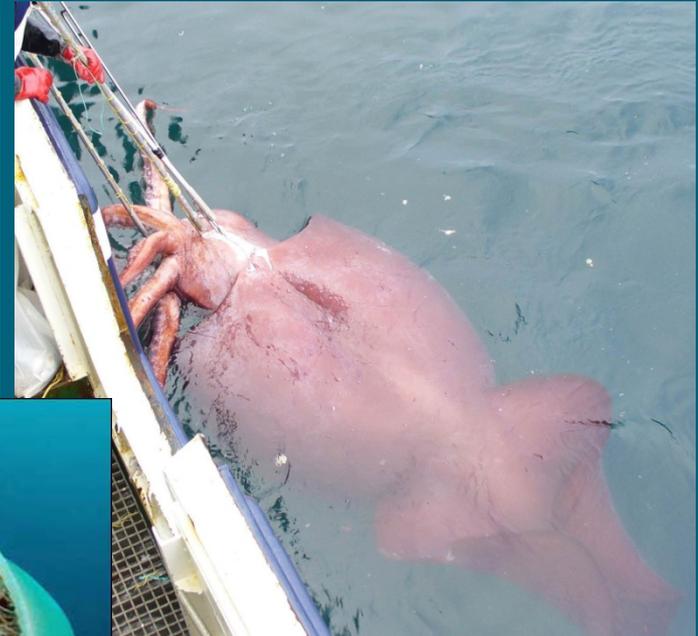
TRANSITION ZONE

- The water pressure in the transition zone is much greater and special suits and diving crafts are necessary for humans to explore this layer of the water column.



TRANSITION ZONE

- There is less food available here (fewer producers) so you begin to see less life in this zone. But- here are some examples...



TRANSITION ZONE

- Temperature: 39 °F (brrrrrrr....!)
- Salinity: Less salt here...(NaCl). Why?
- Water Pressure: pressure is getting greater... (can you feel it?)
 - why?
 - Could you scuba dive here?

Deepest, darkest...

Deep Zone!

- The deepest, darkest region of the ocean is found from about 2000 meters down to the sea floor. It is a realm of perpetual darkness, where even the faintest blue tendrils of sunlight cannot penetrate. It has been called the "Midnight Zone" because it is continually plunged in utter blackness, even when the brightest summer sun is perched high above the surface, there is no "daytime" here.

Way down deep...

Warm!

Surface Zone

• 200 m

Cool

Transition Zone

• 1 km

Cold

Deep Zone

• 2000 m
to the
sea
floor

Deep Zone!

- Life that exists in the midnight zone relies on organisms thriving in the sunny upper layers of the sea. When they die, their bodies rain down upon the sea floor. Sending organic nutrients to feed the animals living at or near the bottom.
- The organic "rainfall" includes dead microscopic organisms, such as phytoplankton and bacteria, and carcasses of larger organisms sinking down to the sea bed.

Deep Zone!

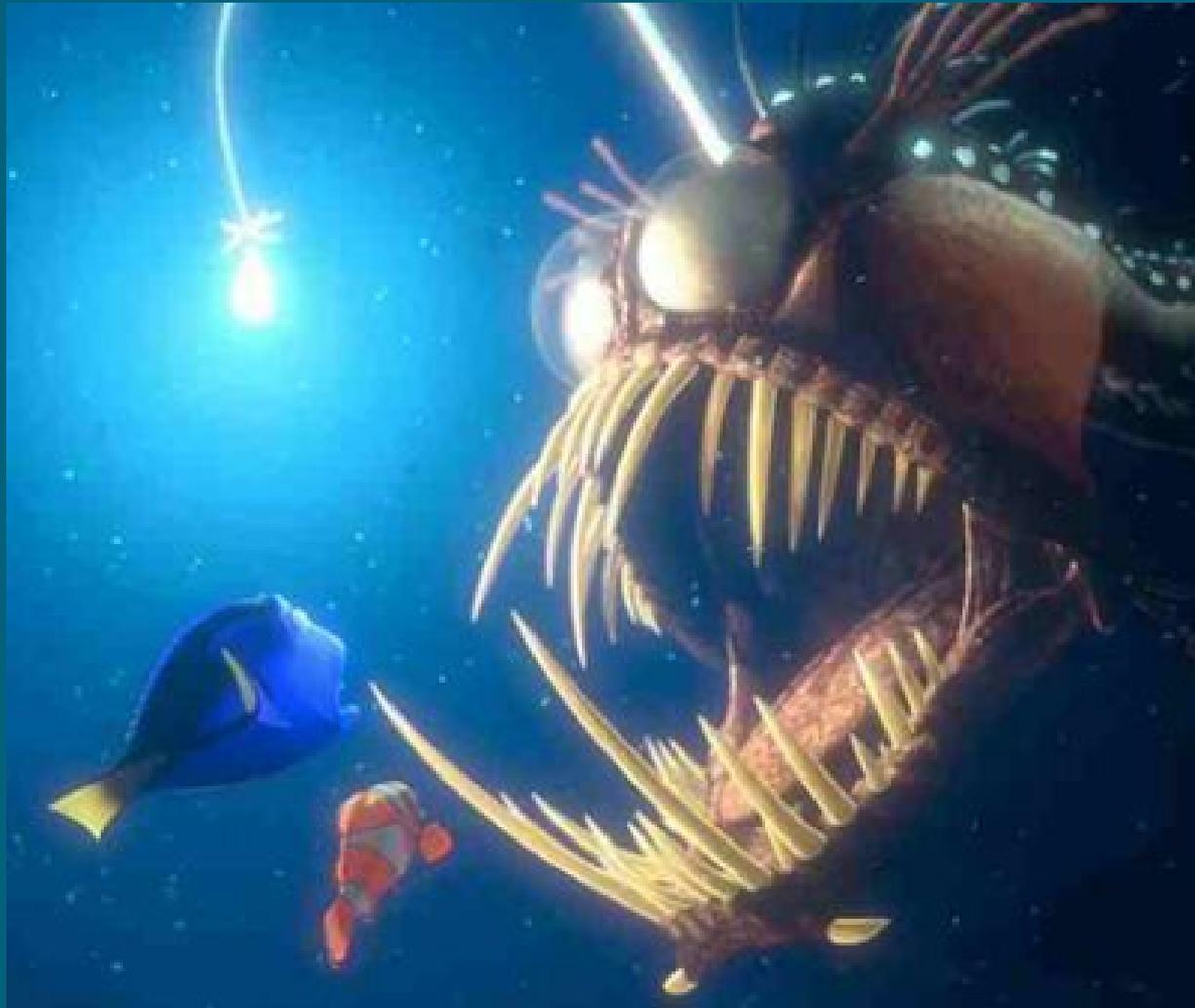
- Many of the creatures thriving in the deep sea have taken on fascinating, gruesome, and horrifying appearances, developing special adaptations to surviving in this harsh environment.
- One of these is what we call bioluminescence.
- Which means that they **GLOW!!**



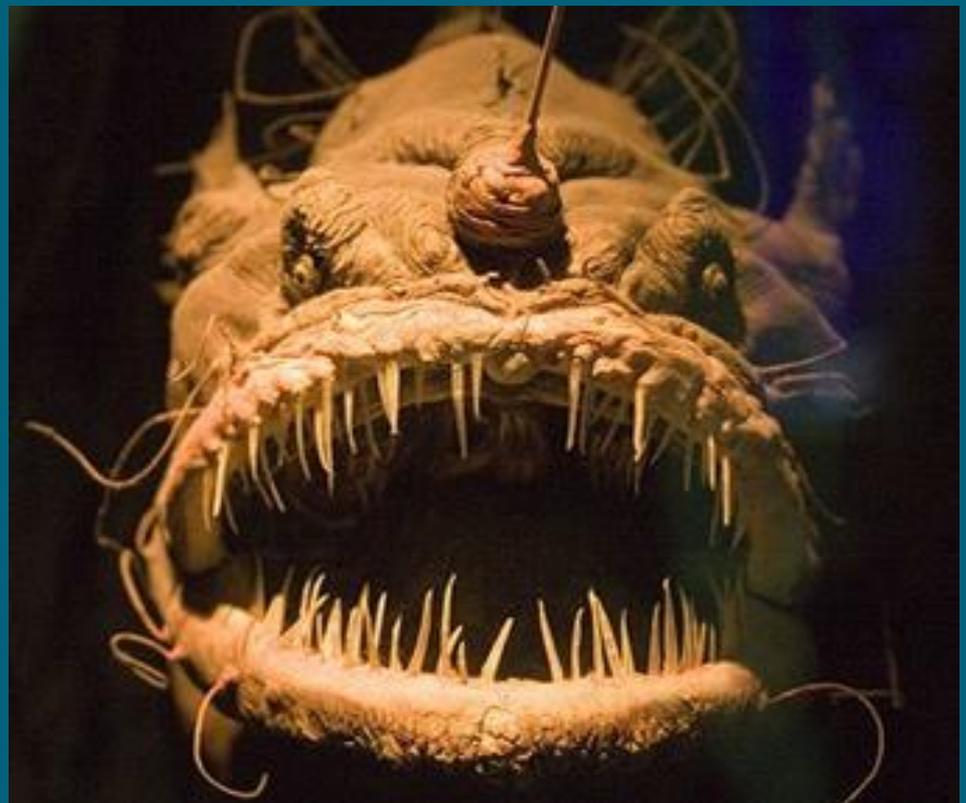




If you thought Finding Nemo was just fake...



Guess again...



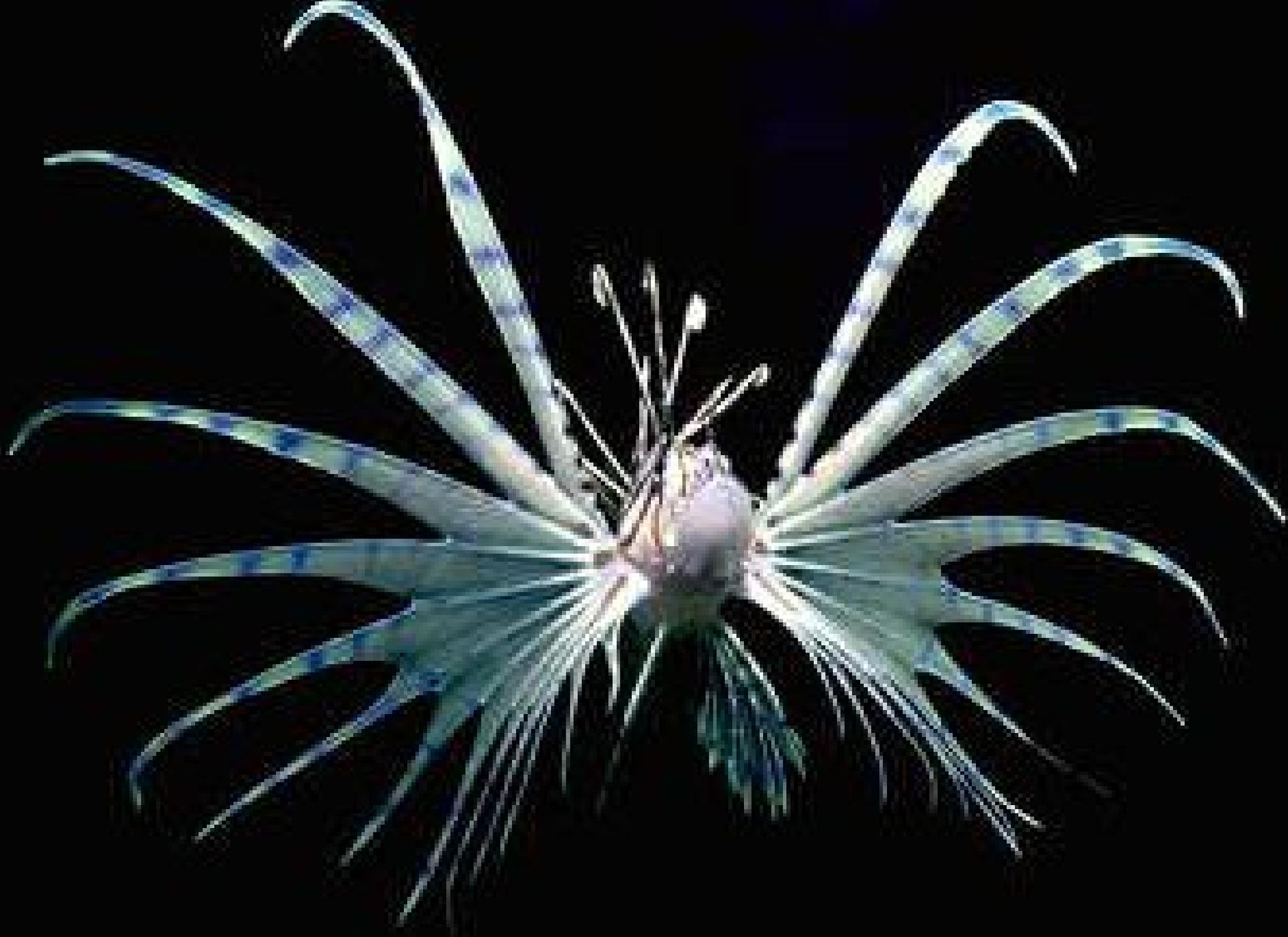


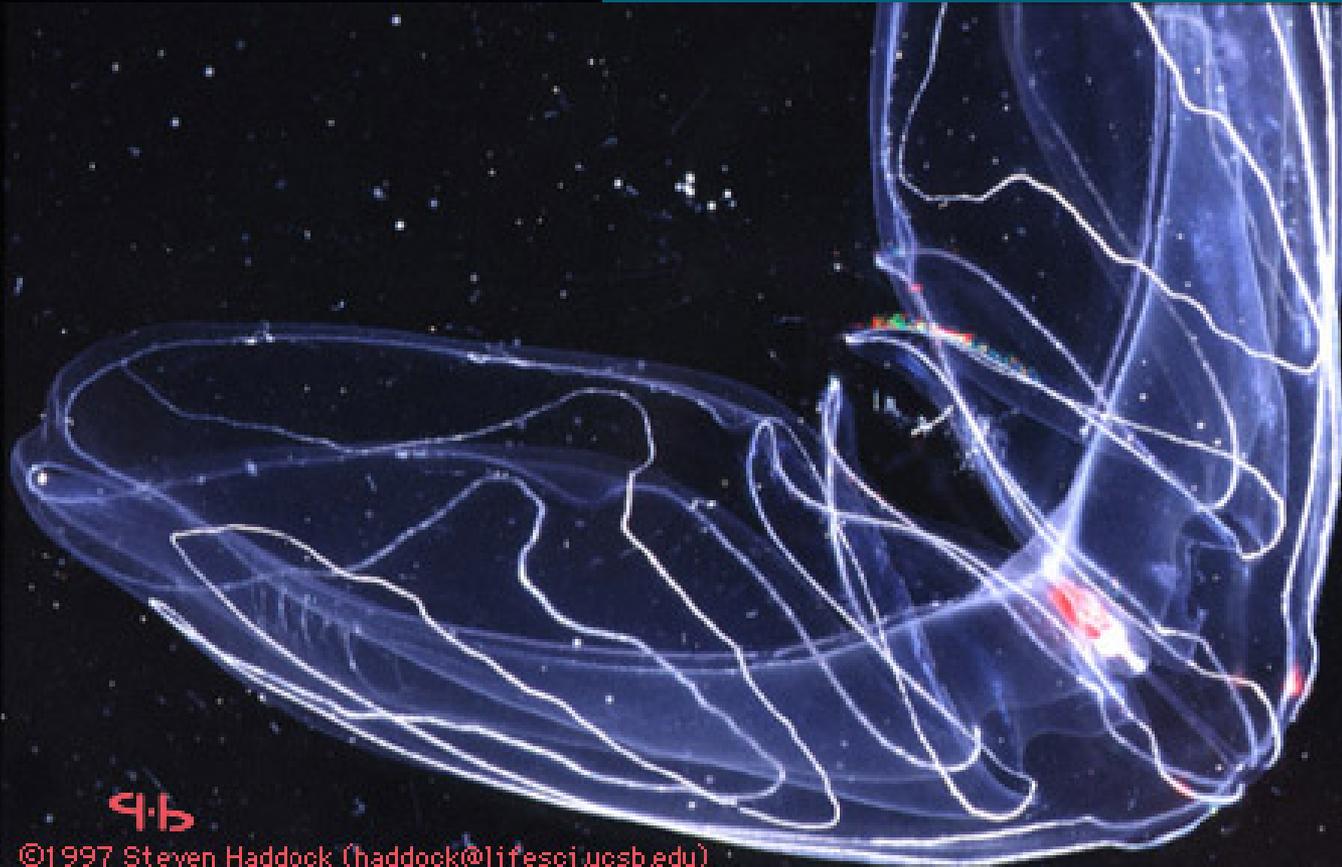
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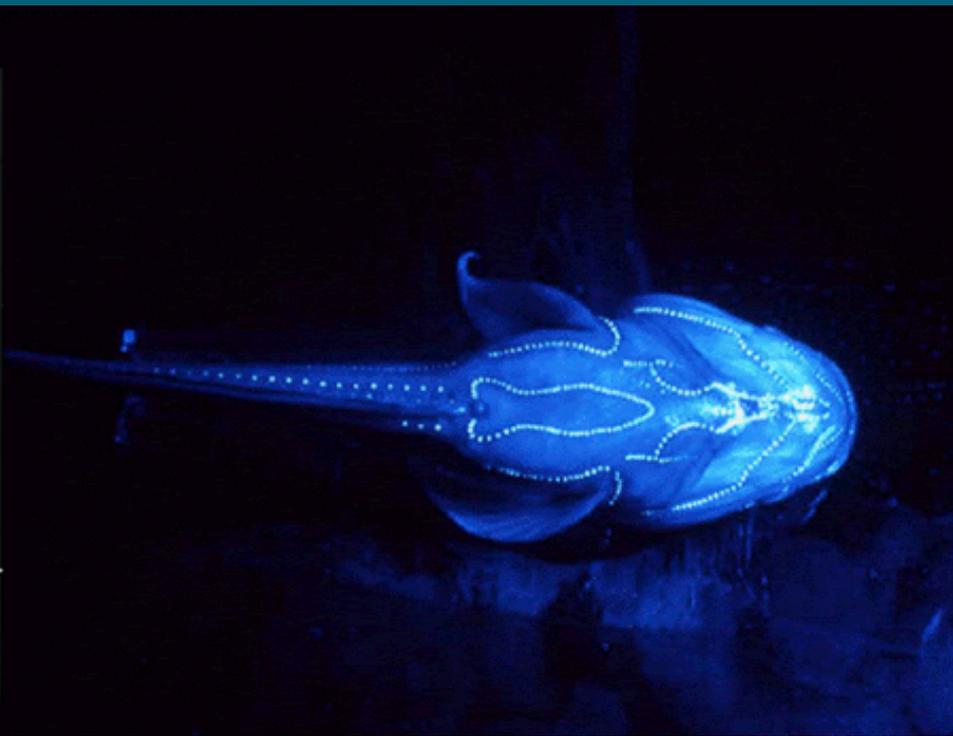


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What do you think this is called?

Psychrolutes microporos AMS I.42771-001





Deep Zone!

- Temperature: 35°F (brrrrrrr.....!)
- Salinity: LEAST amount of salt (NaCl). Why?
- Water Pressure: HIGHEST pressure. It would crush you!
 - why?
 - Could you scuba dive here?

Temperature and Salinity...



Warm



Salt



Cool



Salt



Cold



Salt