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Types of Currents in the Ocean

Surface Currents

- Across the surface and cause mainly by wind
- Move heat around the globe and causes changes in weather

Deep Currents

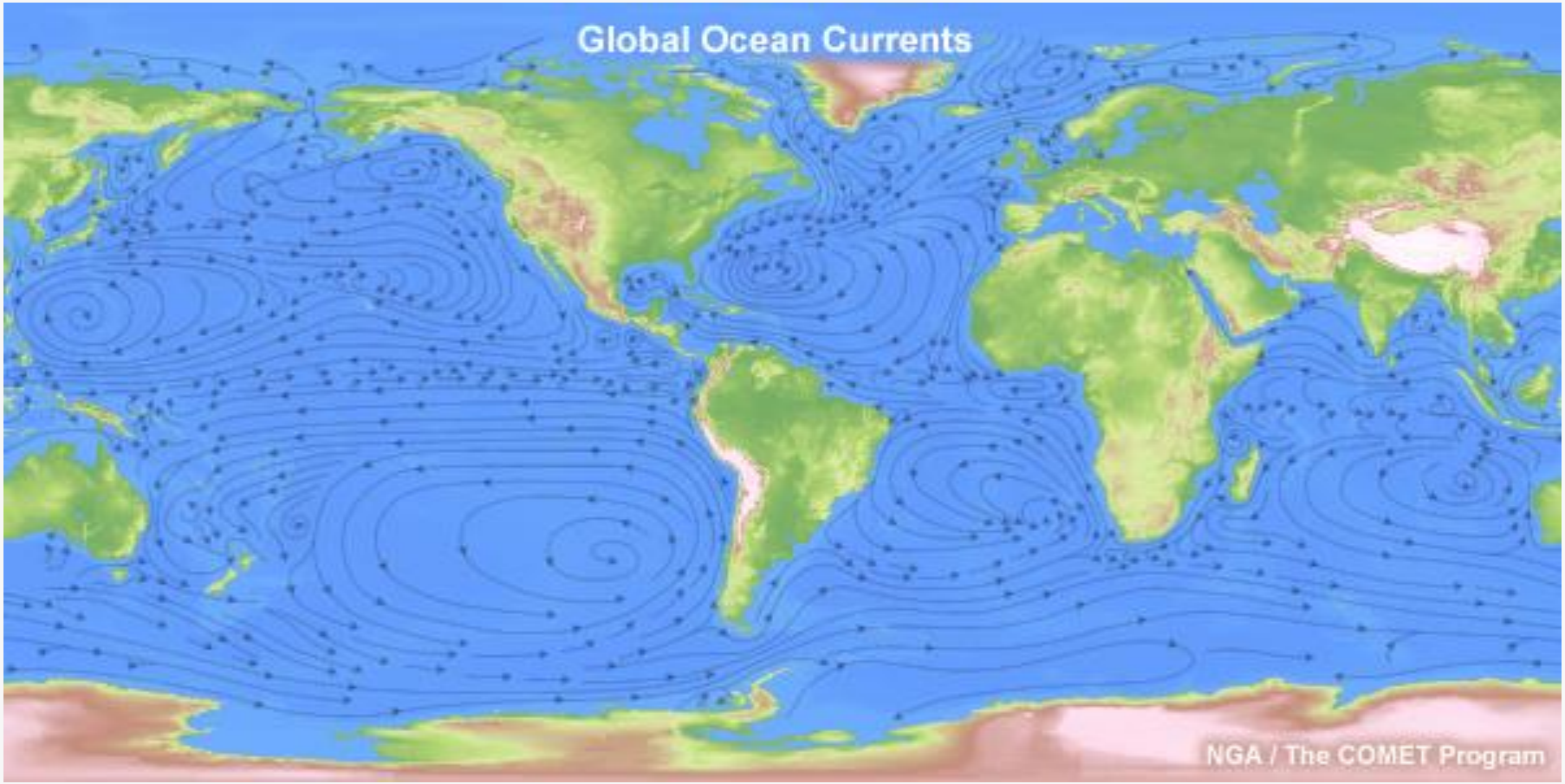
- Across the ocean floor
- Slow moving
- Move heat and nutrients around the globe

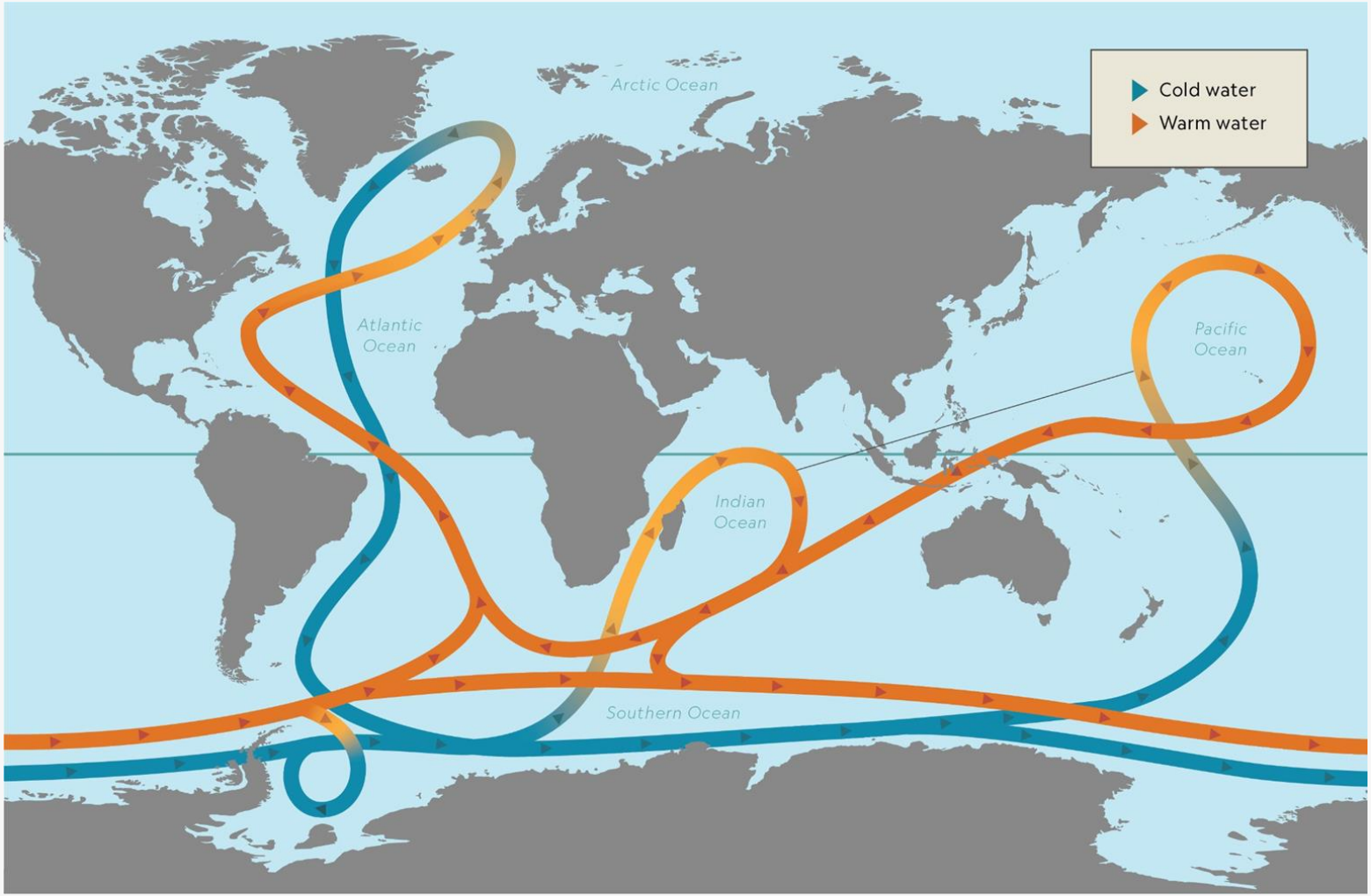
Both affect weather, but surface currents affect it more.

Done Early

Done and have more class time? Check out these links!

- Article about surface currents vs deep ocean currents: https://www.sofarocean.com/posts/understanding-surface-currents-vs-deep-ocean-currents
- Warnings and information about the dangerous kind of currents: https://www.surfertoday.com/surfing/the-differences-between-rip-currents-undertows-and-rip-tides


Global Ocean Currents
NGA / The COMET Program


Cold water
Warm water
Arctic Ocean
Atlantic Ocean
Pacific Ocean
Indian Ocean
Southern Ocean

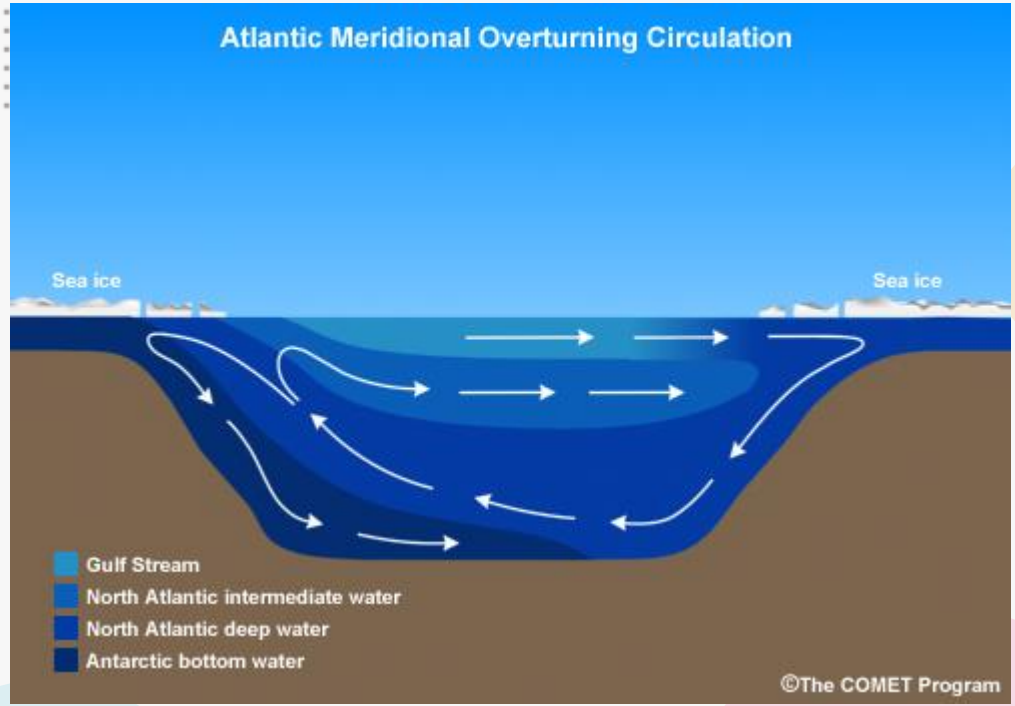

www.Bandicam.com

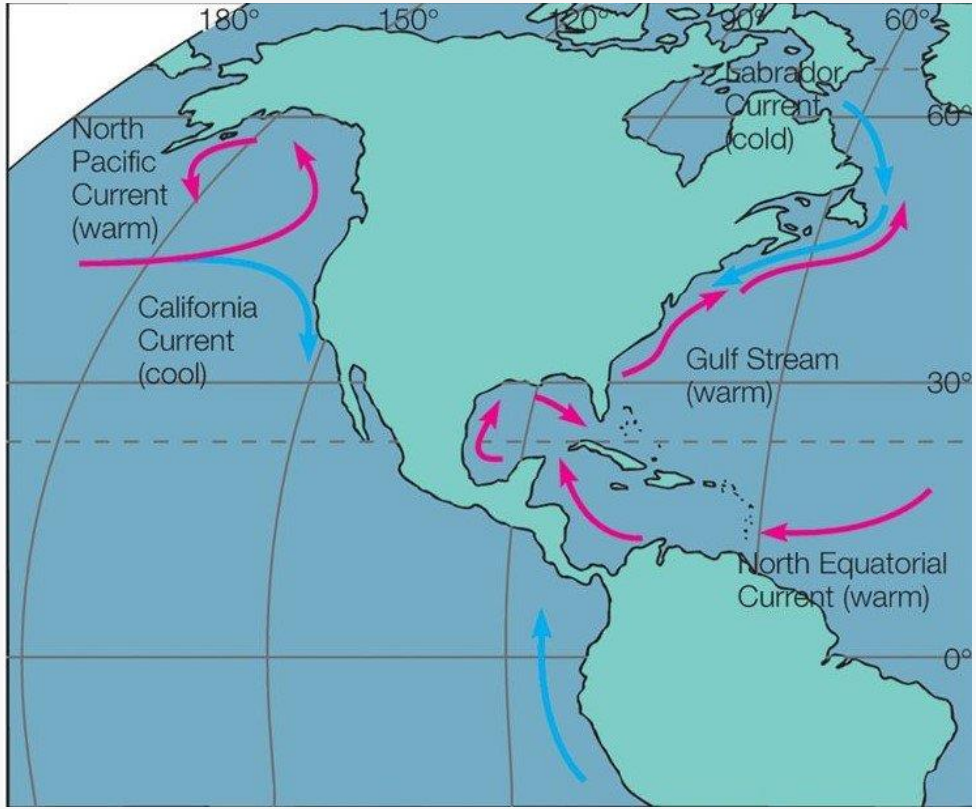
Types of Currents

Surface Currents - Caused mainly by the winds

Deep Ocean - Caused mainly by the difference in salinity

Extra link





How would ocean currents affect the temperatures?

Things to explore!

- Current information from NOAA here
- Great pictures showing different currents here
- Detailed information on oceans and climate here
- Why the oceans are important here
- Information on the Gulf Stream here

What did you learn or find interesting?


9
HOW DO OCEANS CIRCULATE?

Explore More About the Garbage Patches

Information

- https://education.nationalgeographic.org/resource/great-pacific-garbage-patch
- https://oceanservice.noaa.gov/podcast/mar18/nop14-ocean-garbage-patches.html
- https://theoceancleanup.com/great-pacific-garbage-patch/

The clean up

- https://theoceancleanup.com/updates/
- https://www.mrtrashwheel.com/technology/
- https://www.4ocean.com/pages/about

Ways to help

- https://oceanservice.noaa.gov/ocean/help-our-ocean.html
- https://www.oceanicsociety.org/resources/7-ways-to-reduce-ocean-plastic-pollution-today/
- https://oceana.org/living-blue-10-ways-you-can-help-save-oceans/

What did you find interesting or what did you learn?

“The greatest danger to our planet is the belief that someone else will save it.”

- Robert Swan

Real life SpongeBob and Patrick!

Now let’s talk about the ocean zones!

Ocean Zones / Layers

1. Epipelagic Zone (Sunlight Zone)
2. Mesopelagic Zone (Twilight Zone)
3. Bathypelagic Zone (Midnight Zone)
4. Abyssopelagic Zone (The Abyss)
5. Hadalpelagic Zone (The Trenches)

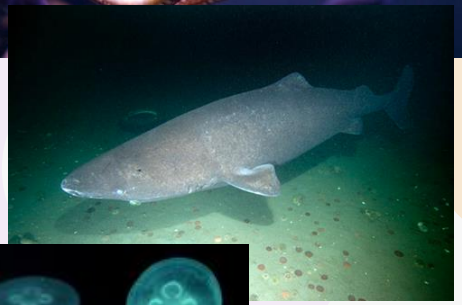
Sunlight Zone

- Lots of light
- 0 - 300 ft
- 90% of marine life
- Green plants


And remember, we keep
our supraesophogeal ganglion...

Twilight Zone

- 300 - 3000 ft
- Water beginning to get darker
- Temperature decreases
- Pressure increases
- Very little light



You are about to enter the

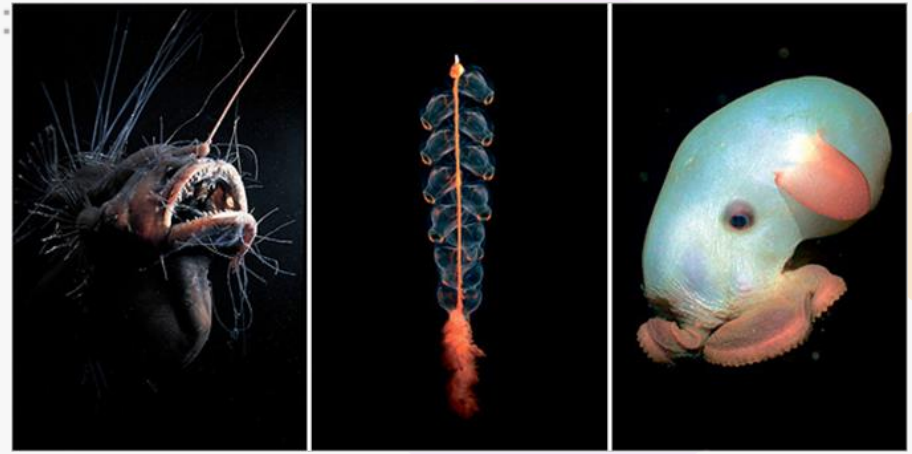
ocean

twilight zone


MOARI

Midnight Zone

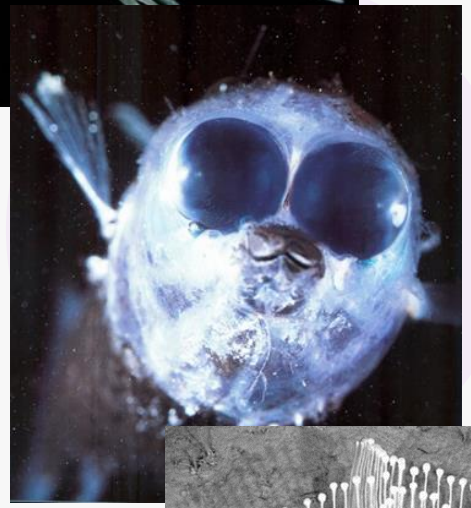
- No light
- Less food
- Less animal life
- Bioluminescence

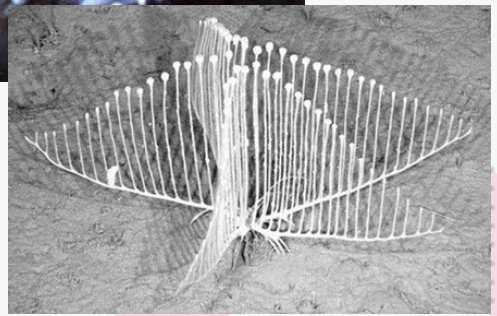


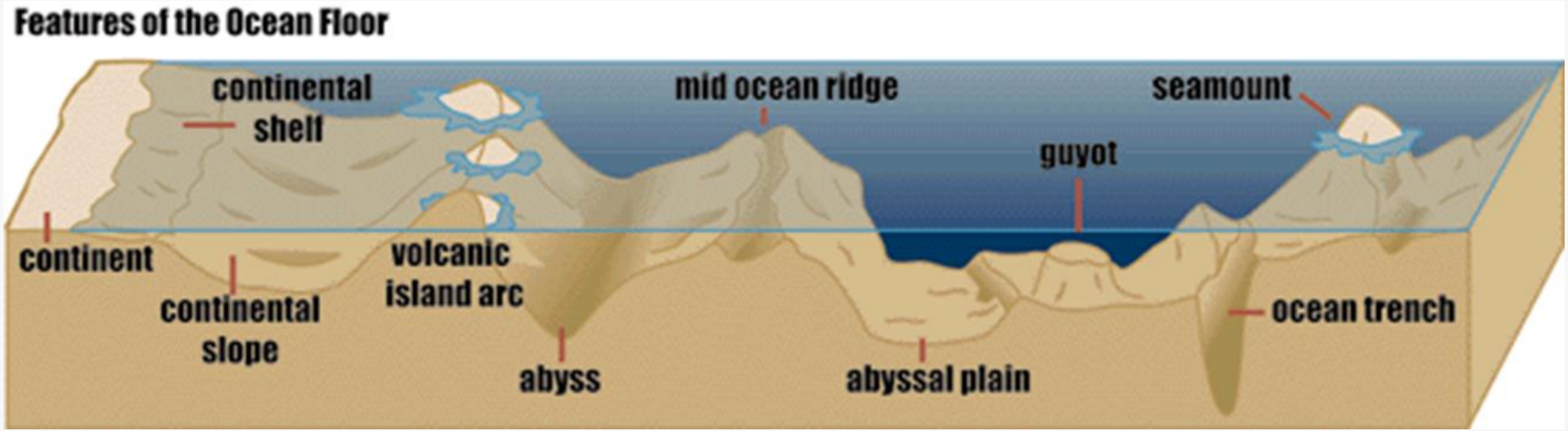

EXPLORING THE DEEP SEA

Abyss Zone

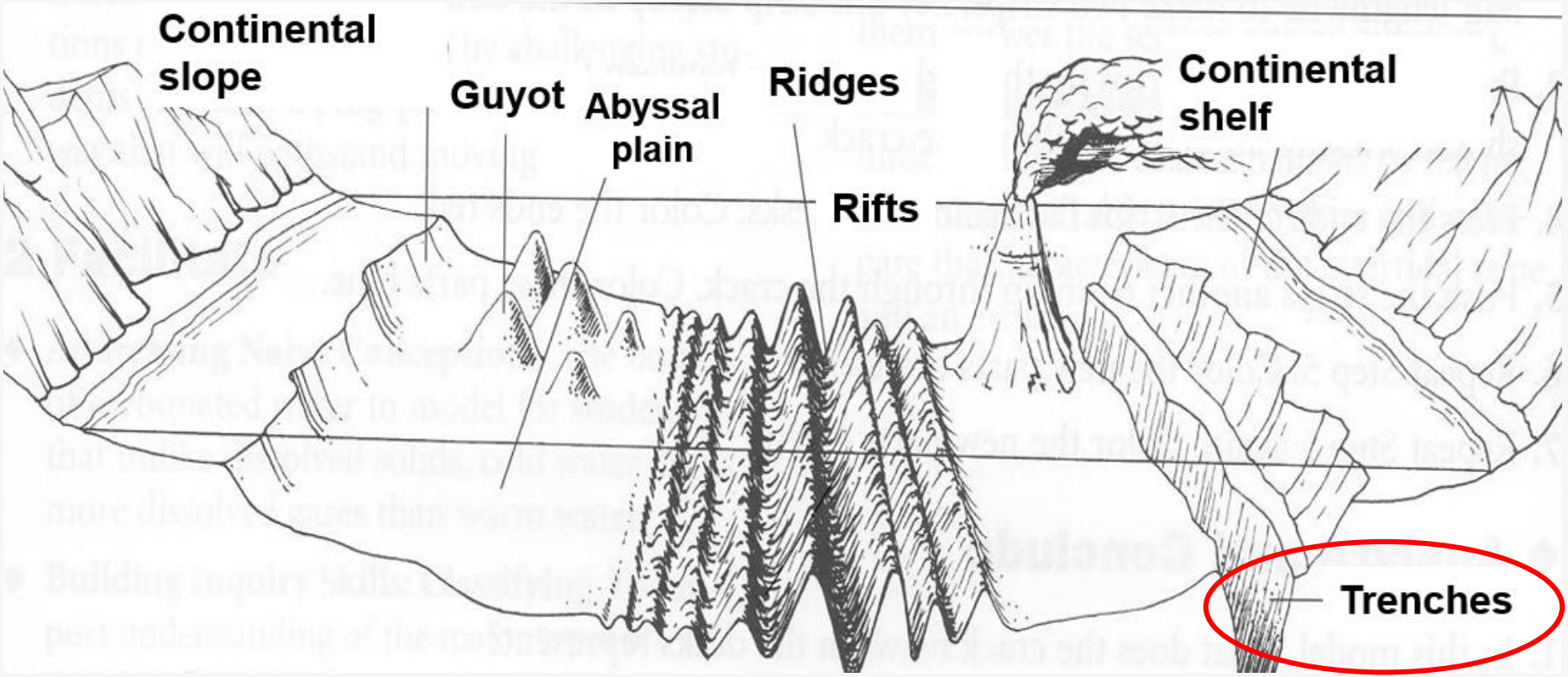
- Scarce food supplies
- Organisms grow slowly
- High water pressure
- Goes to ocean floor
- Remains of marine life from upper zones





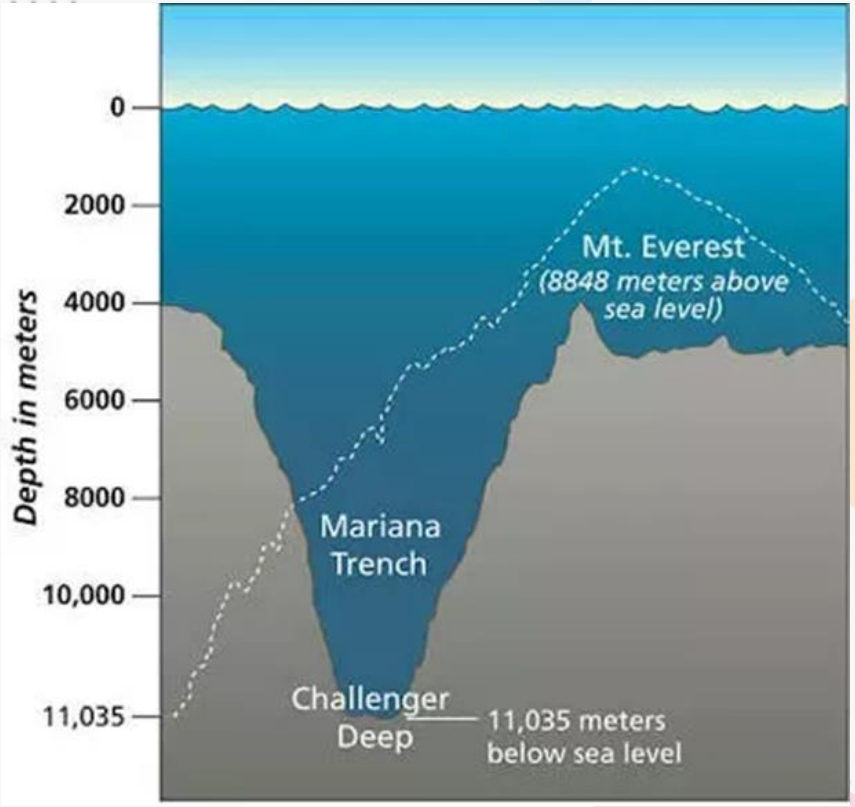


Abyss is the ocean floor for most of the ocean - minus the trenches


Continental slope
Guyot
Abyssal plain
Ridges
Rifts
Continental shelf
Trenches

The Trenches

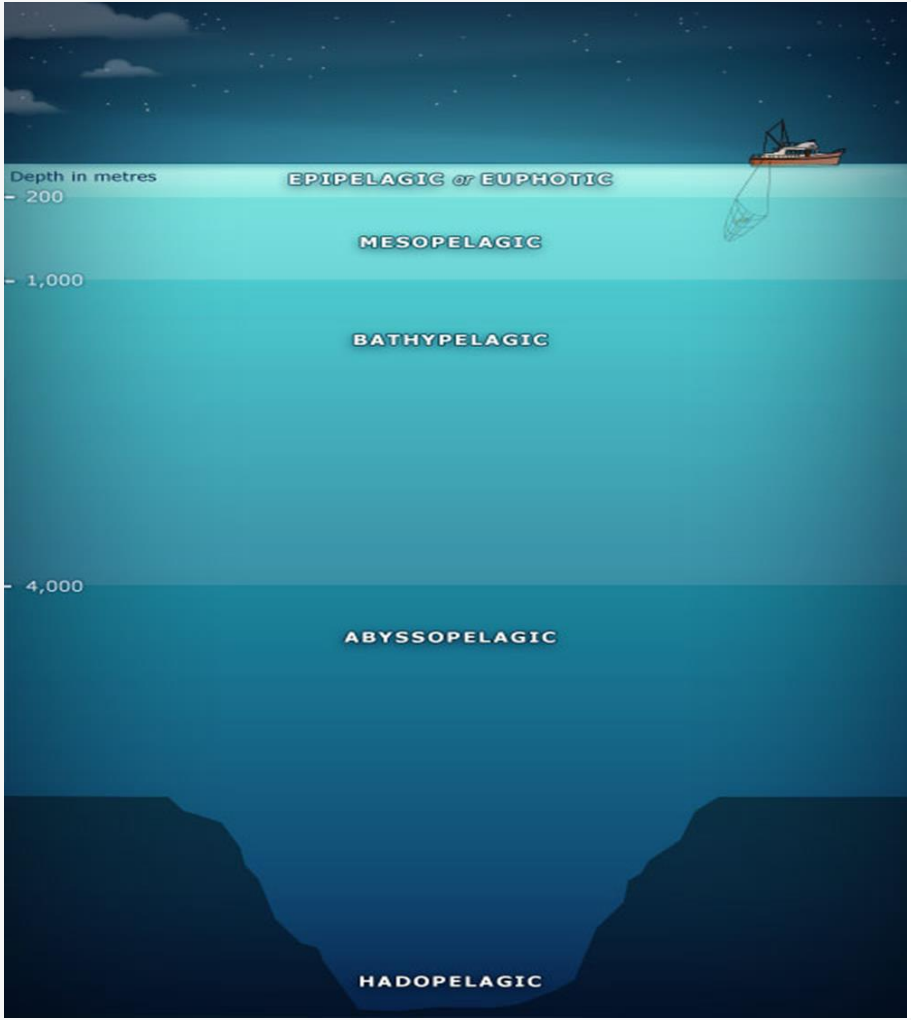
- Found in deep water trenches and canyons
- Goes to 36,201 feet
- Mariana Trench is the deepest part of the ocean




BBC NEWS

Sunlight	Twilight	Midnight	Abyss
Closest to surface Lots of light 90% of marine life Green plants	Water beginning to get darker Temperature decreases Pressure increases Very little light	Less food Less animal life Bioluminescence Glow in the dark animals	Very dark Scarce food supplies High water pressure Goes to ocean floor Remains of marine life from upper zones

Trenches - only in places with canyons in the ocean floor

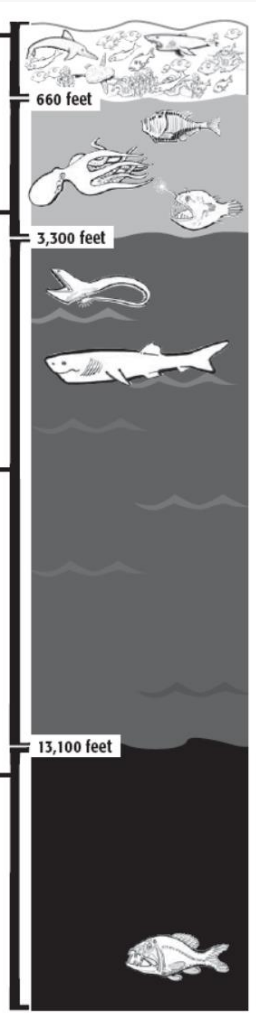


Sunlight Zone
This zone receives light and heat from the sun. That is why so many plants and animals thrive here. Almost 90% of ocean life is in this zone.

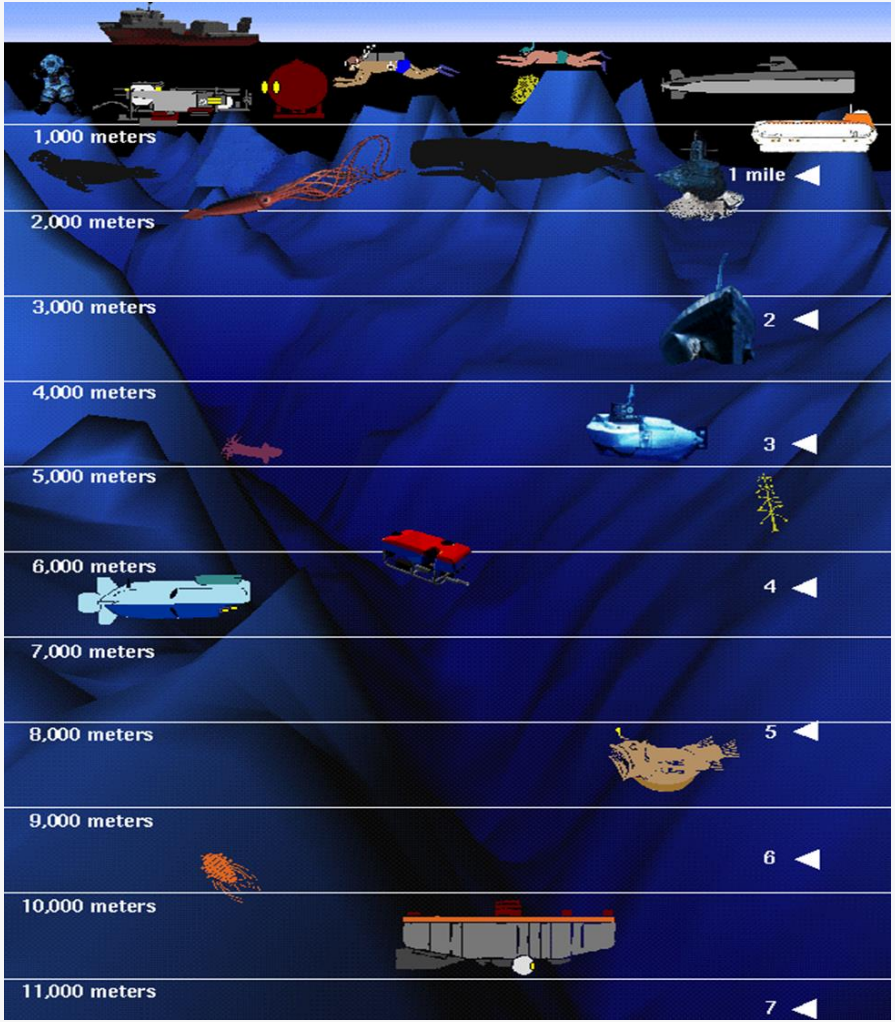
Twilight Zone
Very little sunlight reaches this zone. That is why plants cannot grow here. The animals that live here must be able to survive in a cool, dark habitat. Some of the twilight zone's creatures have light-producing organs.

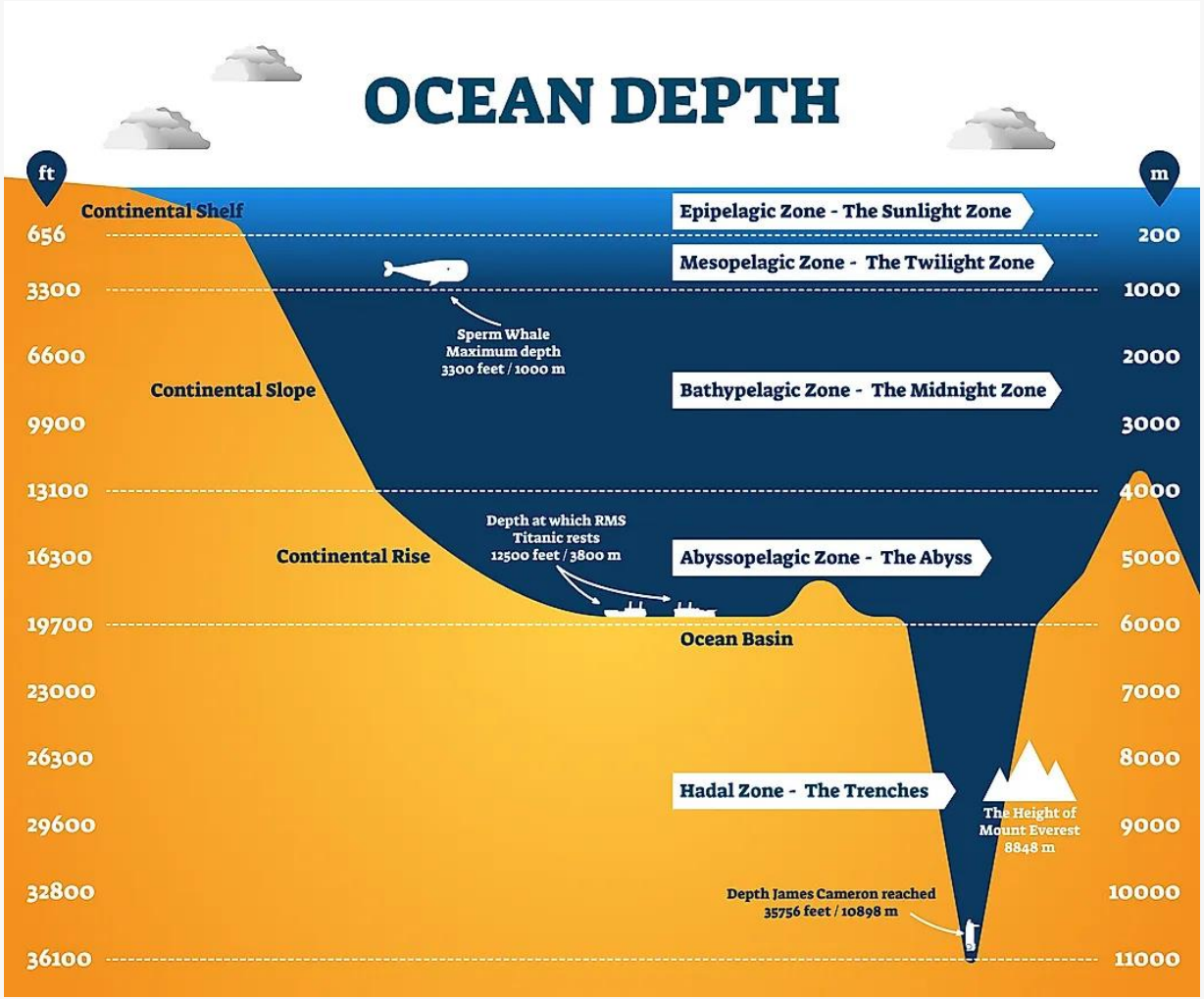
Midnight Zone
This zone does not get any sunlight. It is extremely dark and very cold. The only light in this zone comes from light-producing animals.

Abyss
It is pitch-black and close to freezing at all times here. Only animals that have adapted to the harsh environment can survive.



How deep can they go?



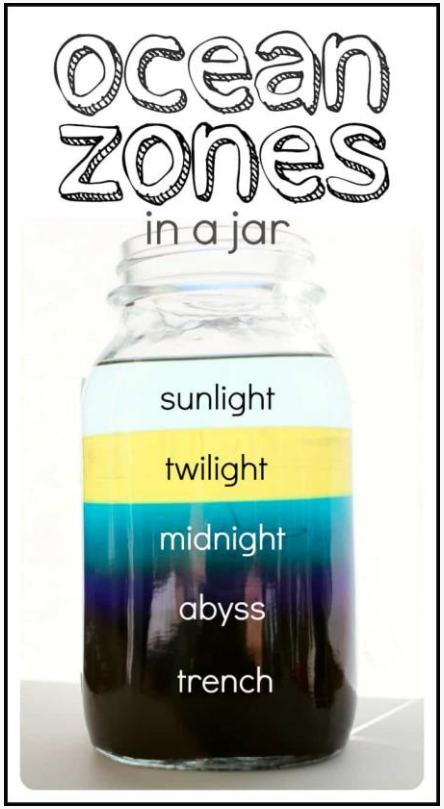

OCEAN DEPTH
ft
m
Continental Shelf
Epipelagic Zone - The Sunlight Zone
656
200
Mesopelagic Zone - The Twilight Zone
3300
1000
Sperm Whale
Maximum depth
3300 feet / 1000 m
6600
2000
Continental Slope
Bathypelagic Zone - The Midnight Zone
9900
3000
13100
4000
Depth at which RMS
Titanic rests
12500 feet / 3800 m
16300
Continental Rise
Abyssopelagic Zone - The Abyss
5000
19700
6000
Ocean Basin
23000
7000
26300
8000
Hadal Zone - The Trenches
The Height of
Mount Everest
8848 m
29600
9000
32800
10000
Depth James Cameron reached
35756 feet / 10898 m
36100
11000

Make a model!

Create a Model of the Ocean Zones

- Has all five zones
  (but trench is only in certain places)
- Information about each zone
  (on the model or in a separate Doc)
- Either digital 3D or physical 3D
- Easy to read and colorful
- An actual model not just information

This will be graded as an assessment grade so do your best on it.



Some Examples You Could Do

What questions do you have?

Create a Model of the Ocean Zones

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Done early

Done early? Listen to a podcast about using the ocean depths to create new medications (https://www.npr.org/2022/08/22/1118837217/searching-the-oceans-depths-for-future-medicines) or explore coral reefs with this atlas (https://allencoralatlas.org/atlas/#10.06/-16.3775/145.8384).