Student Guide

Sediment analysis near the Mid- Atlantic Ridge

(Student names by team)

The goal of Deep Sea Drilling Project was to investigate the sediments and rocks beneath the deep oceans by drilling and coring. The seafloor is usually made up of a thick layer of sediment.

The sediment layer can be up to 2000 meters thick! Below the sediment is a layer of igneous rock, basalt, also called basement rock.

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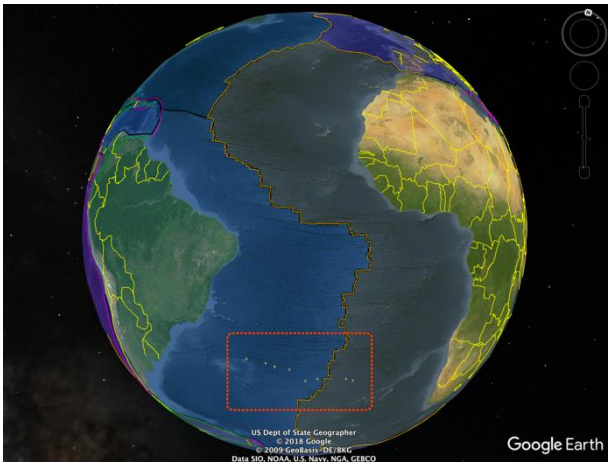
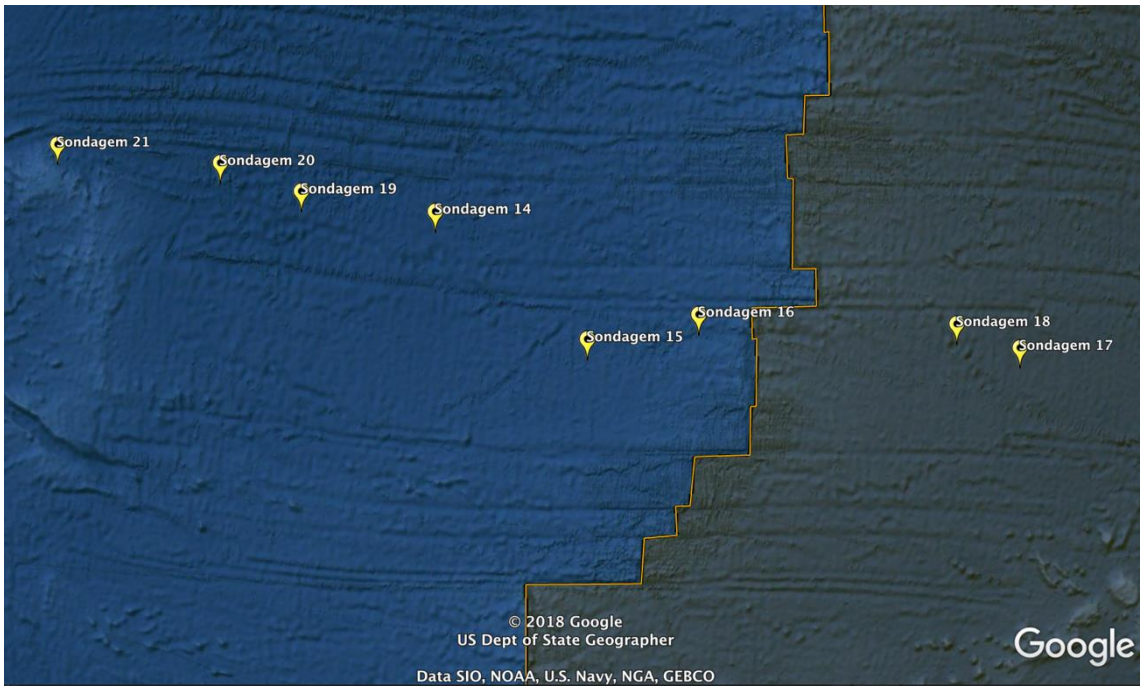
The data in the exercise of the next page were taken from sediment cores collected by the Glomar Challenger. In late 1968, scientist onboard the ship collected sediment core samples at seven sites east and west of the Mid Atlantic Ridge. At each location, they discovered nannofossil oozes that had formed at different time intervals. The age of the sediment in contact with the basement rock at each location was used to date that basement rock formed.

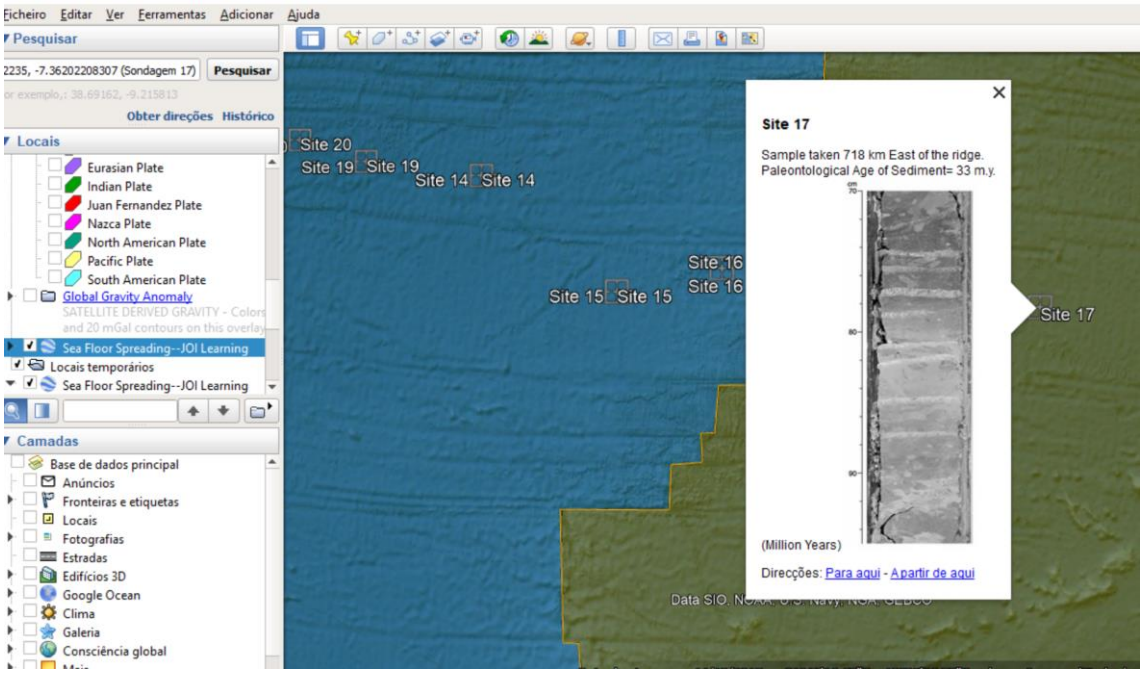




During this activity you will be a scientist. You will analyse the data collected from each sediment core to understand the sediments changes near the Mid-Atlantic and other evidence….

1 – Recording collected data

Open the file "Core in the Mid Atlantic Ridg.kmz" using Google Earth, and complete the table below with the data collected.

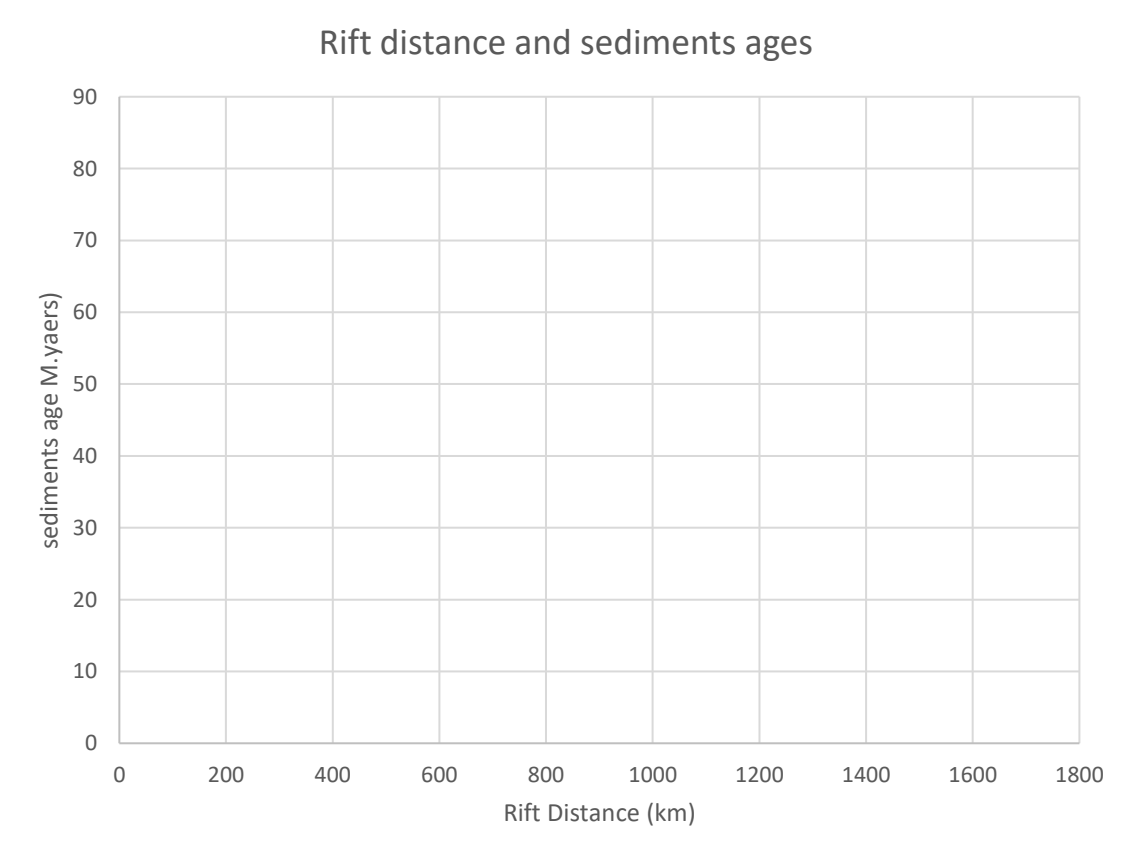


Site number	Dorsal Distance (km)	Sediments age(M.years)	Place to the rift (East / West)
14			
15			
16			
17			
18			
19			
20			
21			

Table 1 – Cores and corresponding dorsal distance (Km), sediments age (millions of years, M. a) and position to the rift.

2 – Graph representation

Construct a graph using the real data collected and try to draw one line that includes almost all the points



3 – Explain the meaning of the graph above.

4 – Show the relationship between age of the sediments and the distance from the spreading centre (East and west).

5 – Make a draft with all legend describing the most important facts that occurred near the med- ridge.

6- Identify the ocean where the sediments were collected.

7 – Identify the structure between the 16th and 18th site.

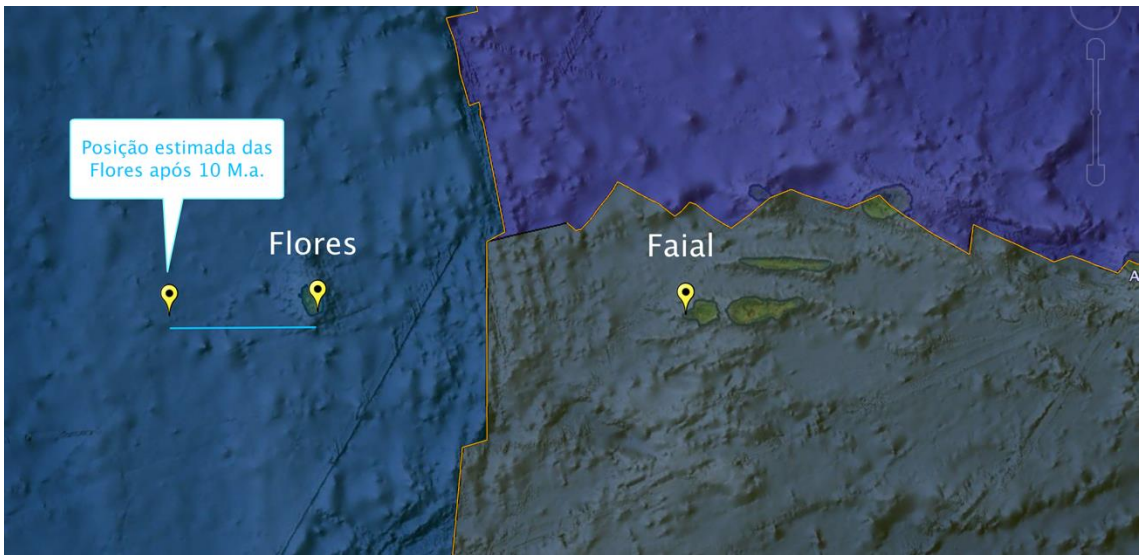
8– Find the seabed expansion rate for each site. Complete the following table.

Site number	Seabed expansion rate (km/M. years)
14	
15	
16	
17	
18	
19	
20	
21	1686 km / 76 M. years = 22,2 km/M. years

9- Estimate the average seafloor expansion rate in km / M. years (kilometres per Million years) from the data in the previous table.

10 - Convert the average rate of expansion of the ocean floor to centimetres per year (cm / year). How would you compare this rate with the rate of growth of fingernails, which is about 0.36 cm / year?

11– Considering the average rate of expansion you calculated in the previous task, how far will the Flores island travel in 10 M. years?



12- What will be the source of the energy required for the expansion of the ocean floor?

Adapted from https://joidesresolution.org/learn-about-seafloor-spreading-with-real-ocean-drilling-data/