

Learning Objectives:

- I can identify the different parts of the ocean composition.

Bellringer Review:

- What are the two main theories of where water came from?
- What causes the tides?
- What configuration would create a really high tide?

Check for Understanding Questions:

- What are the two things that affect Ocean water density?
- What causes the ocean to become saltier?
- What causes the ocean to become less salty?

Salinity

Salinity is the amount of dissolved material in water. It is typically expressed as parts per thousand (‰), called 'permil'. Permil means 'per 1000 parts', in contrast to 'percent', which is 'per 100 parts'. This concentration is a weight ratio: typical sea water has a salinity of about 35‰, meaning one kilogram of sea water contains about 35 grams of dissolved salts. Although there are many dissolved salts in seawater, sodium chloride (NaCl) is the most abundant.

Suppose that you take a sample of 500 g of ocean water and let the water evaporate. The mass of the remaining salts is 17 g. What was the salinity of the ocean water?

Answer:

Set up a proportion to compare the salt in the given amount of water to the unknown amount of salt in 1000 g of water

$$\frac{17g}{500g} = \frac{xg}{1000g}$$

Solve the proportion by multiplying both sides by 1000 g. The unknown amount of salt is the salinity: 34 g.

What would the salinity of the following scenarios be?

22g of salt from 632g of water.

65g of salt from 2000g of water.

Which ocean covers the greatest area?

In the Northern Hemisphere, how does the width of the oceans change as you go from the equator to the pole?

In the Southern Hemisphere, how does the width of the oceans change from the equator to the pole?

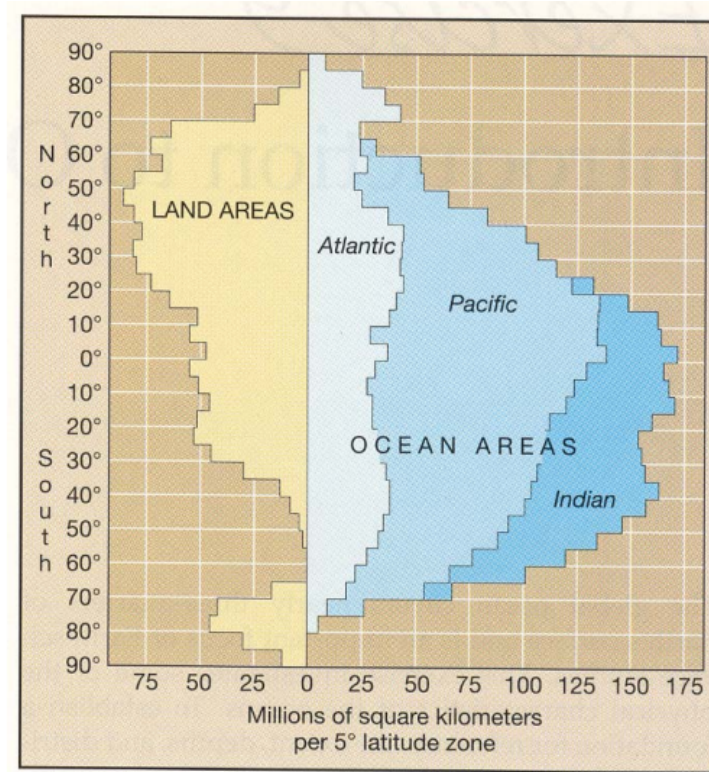


Figure 1: Distribution of land water in each 5° latitude belt. (Figure 13.2A in Earth Science 11th ed., Tarbuck and Lutgens.)

Temperature

Seawater temperature is the most extensively determined variable of the oceans because it is easily measured and has an important influence on marine life. Like salinity, ocean water temperatures vary from equator to pole and vary with depth. Temperature, like salinity, also affects the density of seawater, but density of seawater is more sensitive to temperature fluctuations than salinity. Cool surface water, which has a greater density than warm water, forms in the Polar Regions, sinks and flows towards the tropics.

Check for Understanding Questions:

- What are the two things that affect Ocean water density?
- What causes the ocean to become saltier?
- What causes the ocean to become less salty?

Learning Objectives: Did you accomplish them?

- I can identify the different parts of the ocean composition.

Self-Evaluation

- How well did you understand the material today?
(1-Lost, 2- understand, 3-can teach it)
- How well did you and your team members participate in class?
(1-didn't do anything, 2-Bare minimum, 3-fully participated)

