

Round: 1B

1. At which of the following latitudes would you find **highest**, **intermediate** and **lowest** values for surface water salinity? Briefly explain your reasoning.

A. Equator (0 Deg):

- Intermediate (1 pt), due to Doldrums and Inter Tropical Convergence Zone in the vicinity of the equator, creating fresh water dilution from extensive precipitation (2 pts)

B. 20 Deg North:

- Highest (1 pt), due to the high evaporation in the tropics, leaving the salts behind in the upper surface layer of the ocean (2 pts)

C. 50 Deg North:

- Lowest (1 pt), due to heavy rainfall along primary north Pacific and north Atlantic storm tracks, fresh water river run-off, and fresh water glacial and polar ice melting dilution (2 pts)

2. Give one (1) reason to explain why North Pacific surface waters have a lower salinity than North Atlantic surface waters.

- EITHER Net water vapor transport from E to W in tropics over the narrow low land mass of Central America OR Higher salinity in N. Atlantic is due to brine rejection during sea-ice formation in the N. Atlantic

3. What are two (2) separate implications of this difference in salinity with respect to effects on global ocean circulation?

Any two (2) of the following; 4 pts each; 8 pts total:

- North Pacific surface waters are not salty enough to sink when cooled, but in the N. Atlantic, water is salty enough to sink to form deep water (forming North Atlantic Deep Water or NADW)
- This process is responsible for the global circulation of water masses forming the so called global conveyor belt.
- This is a major mechanism for global heat transport (i.e., heat transport from equatorial regions pole-ward)