Streamers

Purpose
To observe currents caused by differences in salt content.

Materials
2 tablespoons (30 mL) table salt
3-ounce (90-mL) paper cup
Green food coloring
Spoon  Scissors  Masking tape
Serrated knife  Pencil
Clean, empty 2-L plastic soda bottle
Tap water

Procedure
1. Pour the salt into the paper cup.
2. Fill the cup with water and add five or more drops of food coloring to the cup. Stir.
3. Cut off the top third of the bottle with the serrated knife. To do this, make a small slit in the bottle with the knife and then use the scissors to cut around the bottle. Keep the bottom section and cover the cut edges with tape.
4. Fill the bottom section of the soda bottle about three-fourths full with water.
5. Hold the cup so that its bottom is just below the surface of the water in the bottle. Use the pencil to punch a small hole in the bottom of the cup.
6. Observe what happens in the water below the cup.
A stream of green water flows out of the cup and down toward the bottom of the bottle.

Why? The density of the salt water is greater than that of fresh water. Thus, the salt water in the cup is heavier than the fresh (unsalted) water in the jar, causing the salt water to sink. Differences in density of ocean water create ocean currents called density currents. In oceans, denser water sinks and less dense water rises. The density of ocean water is also affected by temperature. As water gets colder, it contracts and its density increases. Thus the colder, denser water at the North and South Poles sinks and moves along the ocean floor toward the equator. At the same time, the warmer, less dense water at the equator rises and moves along the surface toward the Poles.

If salt water freezes, some of the salt is left behind in the water just below the ice, making this water more dense. Evaporation of surface ocean water can also cause water at the surface to have a higher concentration of salt.