



Hands – On Science with NOAA

TITLE: Ocean Motion: Wind driven currents

OVERVIEW:

Model the flow of ocean surface currents by blowing air across a tub of rheoscopic fluid and water, with clay structures simulating coastlines, islands, and sea floor features.

MATERIALS:

Deep clear pan, or tub
Rheoscopic fluid (available from science supplies stores)
Hair drier and/or straws
Clay
Water
Food coloring

INSTRUCTIONS:

In the pan or tub, create land masses and sea floor features out of clay. Fill with water mixed with blue food coloring and rheoscopic fluid to represent the ocean. Have students blow through straws, or use a hair drier, to simulate the wind blowing across the surface of the water. Investigate the resulting currents when the wind comes from different locations, speeds and directions.

SCIENCE EXPLANATION:

Winds, water density and tides all drive ocean currents. Coastal and sea floor features influence their location, direction, and speed. Earth’s rotation results in the Coriolis Effect which also influences ocean currents. Large–scale, surface ocean currents are driven by global wind systems that are fueled by energy from the sun. These currents transfer heat from the tropics to the Polar Regions, influencing local and global climate.

EXTENSION IDEAS:

- Float small pieces of paper or colored plastic on the “Ocean” to simulate marine debris or plankton. Discs from a hole punch work well. Map their path.
- Change the location and shapes of the underwater features and the land masses.
- Have students create winds that will form a La Nina and an El Nino.
- Have students create winds that will form a gyre.
- Investigate and form upwellings.
- Create convection currents with a heat source or ice.
- Have students draw the land masses and the visible water currents.
- Change the direction of the wind and draw again.

EXPLORE FURTHER

The Pacific Garbage Patch

<http://marinedebris.noaa.gov/info/patch.html>

Major Ocean Currents

http://www.srh.noaa.gov/jetstream/ocean/currents_max.htm

Ocean Currents Forecasts

<http://www.opc.ncep.noaa.gov/GlobalOceanStart.shtml>

Ocean Currents Education Resources

http://www.education.noaa.gov/Ocean_and_Coasts/Ocean_Currents.html



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