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Can buoys predict hurricanes?

Objectives

Students will be able to:

- track drifter buoys
- determine the course of the gulf stream current

Materials

computers with Internet access

[Student Worksheet](#)

Background

Drifter Buoys

The hurricane array of drifter buoys are free drifting buoys deployed every year by Atlantic Oceanographic and Meteorological Laboratory (AOML) and NAVOCEANO, in the tropical Atlantic, prior to the hurricane season to help in the prediction and forecast of hurricanes. In addition to measuring sea surface temperature (SST) the buoys also measure barometric pressure (B), wind speed and direction (W).

The purpose of the annual deployment of the hurricane array is to provide forecasters with surface meteorological data in the region of hurricane development. Normally, weather data over the oceans is observed and sent by merchant ships, but obviously these ships will divert from their normal tracks to avoid areas of rough weather so there is a dearth of data where and when it is needed most. Thus, the buoy data (and data collected by satellites and special research aircraft) are very important.

Each buoy is a 14 inch sphere which floats partially submerged. A "holey sock" drogue centered at 15 meters depth reduces the effect of the wind pushing the buoy through the water. Data are acquired continuously and then an average for each sensor is calculated at the top of the hour. When a satellite passes overhead (roughly every six hours), the past four hourly sets of averaged data are transmitted. The satellite also measures the location of the buoy.

Drifter buoys can be tracked to show the path of currents.

Procedure

The hurricane array of drifter buoys are free drifting buoys deployed every year by Atlantic Oceanographic and Meteorological Laboratory (AOML) and NAVOCEANO, in the tropical Atlantic, prior to the hurricane season to help in the prediction and forecast of hurricanes. The hurricane array provides forecasters with surface meteorological data in the region of hurricane development. Normally, weather data over the oceans is observed and sent by merchant ships, but obviously these ships will divert from their normal tracks to avoid areas of rough weather so there is a dearth of data where and when it is needed most. Thus, the buoy data (and data collected by satellites and special research aircraft) are very important.

1. Obtain the [Deployment Details](#) of the most recent buoy deployment.
2. Complete the table on the Student Worksheet by obtaining the Buoy ID #, the latitude and longitude of the deployment.
3. Click on the Performance Table to obtain the most recent information about the buoy.
4. Record in the table the buoys status.
5. Click on Near Real Time Tracks and Data Profiles from the GTS
6. In the top portion of the map, type one of the alive Buoy ID numbers.
7. Adjust the size of the red box to increase or decrease the area of interest.
8. Select the appropriate dates, Initial and Final and click Go.
9. Select the same dates from the [Gulf Stream SST image archives](#) and [velocity image archives](#). Use the images to confirm the path of the buoy.

Assessment

- 1) Did the buoy take a direct path or did it meander?
- 2) Define meander.
- 3) Explain the movement.
- 4) Daily Drifter Tracks - What is the net (overall) movement of the drifter buoys?
- 5) Why are buoys still used?

[Archived image of Tracker Buoys](#)

[All Tracker Buoys image](#)

[North Atlantic Average Velocities](#)

Implementation Tips

Make sure to practice using the tracking web site before using the site with students. It takes a little practice to become adept at manipulating the "red box" to get the data needed to complete the lesson.

If you feel your students will become frustrated attempting to gather the necessary data on their own, it might be beneficial to lead the class by projecting the web site and do the navigation yourself.

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Student Worksheet: Drifters

Name: _____

Directions

1. Obtain the Deployment Details of the most recent buoy deployment.
2. Complete the table by obtaining the Buoy ID #, the latitude and longitude of the deployment.
3. Click on the Performance Table to obtain the most recent information about the buoy.
4. Record in the table the buoys status.
5. Click on Near Real Time Tracks and Data Profiles from the GTS
6. In the top portion of the map, type one of the alive Buoy ID numbers.
7. Adjust the size of the red box to increase or decrease the area of interest.
8. Select the appropriate dates, Initial and Final and click Go.

ID #	WMO#	Deployment date	Deployment Latitude & Longitude	Status	Latest Latitude & Longitude	Direction Traveled

Assessment

1. Did the buoys take a direct path or meander?

2. Define meander.

3. Explain the movement.

4. Daily Drifter Tracks - What is the net (overall) movement of the all drifter buoys?

5. Why are buoys still used?