

SOCCOM.Act.PDS.1.1: Tracking Ocean Currents



Goals

In this activity you will:

- Use SOCCOM float data to learn about ocean currents.
- Learn about circulation in the Great Southern Ocean.
- Find where Huey, Dewey, and Louie are.
- Investigate the nature of ocean gyres.

What To Turn In

- This first page, as a cover sheet
- Your written answers, properly formatted
- A filled-in copy of the “Reported Locations For Several Floats In The Southern Ocean” table
- A neatly made “Calculated Drift Rates For Several Floats In The Southern Ocean” table
- A neatly marked map of the world showing where selected Floats are located

Visit the home page for the SOCCOM project, which is at <http://soccom.princeton.edu>.

Click on the “Observations” drop-down menu, and choose “Map Room.” This will take you to the SOCCOM Map Room.

In the Map Room, click on the link for the [Oceanographic Autonomous Observations Map](http://www.oao.obs-vlfr.fr/maps/en/) (the link is embedded in the line “SOCCOM float tracking and data profiles”).
(<http://www.oao.obs-vlfr.fr/maps/en/>)

This interactive OAO map will allow you to track not just the SOCCOM floats, but the floats of several other projects as well. If you can’t find a float on the OAO Map, it might be because it’s not part of the SOCCOM group. Make sure you have changed the “Project” setting to show all floats.

Part A: Currents And The Southern Ocean

1. Obtain from your teacher [a copy of the blank table entitled “Reported Locations For Several Floats In The Southern Ocean.”](#) Fill it in, using the interactive OAO Map listed above. Report your latitudes and longitudes to the nearest tenth of a degree.

[This web site](http://stevemorse.org/nearest/distance.php) may help you to calculate the distances between map locations
(<http://stevemorse.org/nearest/distance.php>).

[This web site](http://www.timeanddate.com/date/duration.html) may help you to calculate the number of days between two given dates
(<http://www.timeanddate.com/date/duration.html>).

2. Using the data from the table you filled in for question #1, create a brand new, separate table. It should be set up like this:

Calculated Drift Rates For Several Floats In The Southern Ocean				
Float Name	Which part of the Southern Ocean	Distance Covered From Deployment To Last Report (kilometers)	Number Of Days In Operation (From Deployment To Last Report)	Drift Rate (km per day)
7552	Indian Ocean Near Australia			
6901004	Indian Ocean Near Australia			
5146	Indian Ocean Near Africa			
9260	Indian Ocean Near Africa			
6968	Pacific Ocean			
9092	Pacific Ocean			
9031	Pacific Ocean			
0508	Atlantic Ocean Near Africa			
6901585	Atlantic Ocean Near Africa			

Part B: Huey, Dewey, & Louie

Continue to use the interactive OAO map listed above to answer the following questions about three SOCCOM floats.

3. Float 9668 on the map. This is “Huey.” To the nearest tenth of a degree, what is its most recent position? Where in the world is this?
4. Describe Huey’s motion. What current(s) might be involved?
5. Find Float 9646 on the map. This is “Dewey.” To the nearest tenth of a degree, what is its most recent position? Where in the world is this?
6. Describe Dewey’s motion. What current(s) might be involved? Discuss surface currents and deep currents (including the ACC).
7. Find Float 9666 on the map. This is “Louie.” To the nearest tenth of a degree, what is its most recent position? Where in the world is this?
8. Describe Louie’s motion. What current(s) might be involved? Discuss surface currents and deep currents (including the ACC).
9. Given the deployment dates for Floats 9668 (Huey), 9646 (Dewey), & 9666 (Louie), what conclusions can you reach about their motion?
10. (TRQ) Why do you think Floats 9646 (Dewey) and 9666 (Louie) were deployed so close together? Do you think this was a good idea? If so, were other SOCCOM floats deployed closely? If you don’t think this was a good idea, then why not? Either way, be sure to support your reasoning with evidence.

Part C: Going Nowhere Fast

Continue to use the interactive OAO map listed above to answer the following questions about three non-SOCCOM floats.

11. Find Float B07_6900683 on the map. To the nearest tenth of a degree, what is its most recent position? Where in the world is this?
12. Find Float CALYPSO on the map. To the nearest tenth of a degree, what is its most recent position? Where in the world is this?
13. Find Float CSIRO_1901347 on the map. To the nearest tenth of a degree, what is its most recent position? Where in the world is this?
14. (TRQ) What do the locations of Floats B07_6900683, CALYPSO, and CSIRO_1901347 have in common? Do their movement patterns support your inference? Also, are there other nearby floats that support your inference?

Part D: Where Are All These Floats, Anyway?

15. Obtain from your teacher a copy of a blank map of the world. Plot the most recent locations of the following floats, by writing the number of the float in the correct location on the map (remember to keep your map neat and legible!). Attach a key to your map. The key should look like this:

Number On Map	Float Name
1	7552
2	6901004
3	5146
4	9260
5	6968
6	9092
7	9031
8	0508
9	6901585
10	9668 ("Huey")
11	9646 ("Dewey")
12	9666 ("Louie")
13	B07_6900683
14	CALYPSO
15	CSIRO_1901347

16. Why is a Mercator projection map difficult to use when studying the Southern Ocean?
17. The arrows in the map are schematic only. Discuss the difficulties of knowing how currents at different depths actually behave in reality.
18. Discuss how floats enable scientists to understand deeper current behavior.

Reported Locations For Several Floats In The Southern Ocean

Float Name	SOCOM ?	Which part of the Southern Ocean	Deployment Date	Last Reported Date	Deployment Latitude	Deployment Longitude	Last Reported Latitude	Last Reported Longitude
7552		Indian Ocean Near Australia						
6901004		Indian Ocean Near Australia						
5146		Indian Ocean Near Africa						
9260		Indian Ocean Near Africa						
6968		Pacific Ocean						
9092		Pacific Ocean						
9031		Pacific Ocean						
0508		Atlantic Ocean Near Africa						
6901585		Atlantic Ocean Near Africa						

