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# EDDIES IN OUR OCEANS

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What are the words that come to mind when you think of an eddy? Swirling, round, fast moving? Or maybe you have never heard about eddies or have seen one? If you haven't, have a look the next time you are walking along a river bank! What you need to look out for is in Figure 1.



FIGURE 1: SMALL EDDIES IN A RIVER <sup>1</sup>

These features also happen in our ocean but are much, much bigger and can be 100's of kilometres wide. The eddy in Figure 2 is off the coast of Africa and is 150km wide! This NASA video shows you the extent of them throughout our oceans, they are everywhere!

<https://www.nasa.gov/topics/earth/features/perpetual-ocean.html>



FIGURE 2: OCEAN EDDY WITH A PHYTOPLANKTON BLOOM INSIDE <sup>2</sup>

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## HOW DO THEY OCCUR?

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Ocean currents meander just like rivers on land. As they meander a bend can form, as the bend becomes more severe it will ultimately 'cut off'. It is the same way an oxbow lake is formed in a river. However in the ocean this 'oxbow lake' now becomes an eddy and it starts to rotate! Go to Figure 2 at the following link to see a good animation of how they form in the Gulf Stream

[http://tornado.sfsu.edu/geosciences/classes/m415\\_715/Monteverdi/Satellite/Oceanography/eddy.htm](http://tornado.sfsu.edu/geosciences/classes/m415_715/Monteverdi/Satellite/Oceanography/eddy.htm)

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<sup>1</sup> <https://theheartofthematter-dailyreminders.org/2015/10/26/eddies-and-whirlpools-redux/>

<sup>2</sup> <https://www.livescience.com/18445-eddy-ocean-nasa-satellite-image.html>

## ARE THEY ALL THE SAME?

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As you will see in the previous link you can get two types of eddies. They will either have a cold core surrounded by warm water or a warm core surrounded by cooler water! These have different names; warm centers are anticyclonic and cold centers are cyclonic and they rotate in opposite directions. Is the eddy only on the surface? No the eddy can affect the water up to a depth of 2.5km! In the Ryan Institute at NUIG we have been involved in a number of transatlantic crossings and have studied the oceanography and biology of 3 warm core eddies between 2014-2016 off the coast of Newfoundland. We found that the eddies had certain species of squid and fish that would normally be recorded much further south in the sub tropics!

## ARE THEY IMPORTANT?

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As the eddies rotate plankton and small fish become entrained or stuck. This then acts as a food source and the food chain can build inside the eddy. On one of our transatlantic trips when we reached the edge of the eddy there were more than 100 pilot whales feeding! It must be like a drive through restaurant for them! The eddies act as transporters, similar to buses as they travel across the ocean. Not only are they important in biological terms but they can also transport nutrients as well as heat.

It has recently been discovered that sharks use warm core eddies to feed. Have a look at the University of Washington's videos on the following link and you can also see a video of how they put a tag onto Lydia the Great White Shark! <https://www.washington.edu/news/2018/06/18/great-white-sharks-dive-deep-into-warm-water-whirlpools-in-the-atlantic/>

Eddies can last months or even years as they travel across the oceans. Scientists use a wide range to satellite products to track and monitor them.

I hope the next time you see a little eddy in a river you will think about how big they can be in the ocean!

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### OTHER VIDEOS TO WATCH:

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- Making a vortex ring in a pool  
[https://www.youtube.com/watch?v=2TQIb\\_cZGDM](https://www.youtube.com/watch?v=2TQIb_cZGDM)
- Hunting for coastal eddies through the Clockwork project  
<https://www.clockwork-ocean.com/index.html.en>

This blog is brought to you by Sheena Fennell, an oceanographer in [Earth and Ocean Sciences at NUI Galway](#).

Part of a Nature Series by the Ryan Institute during #LockDownIreland



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