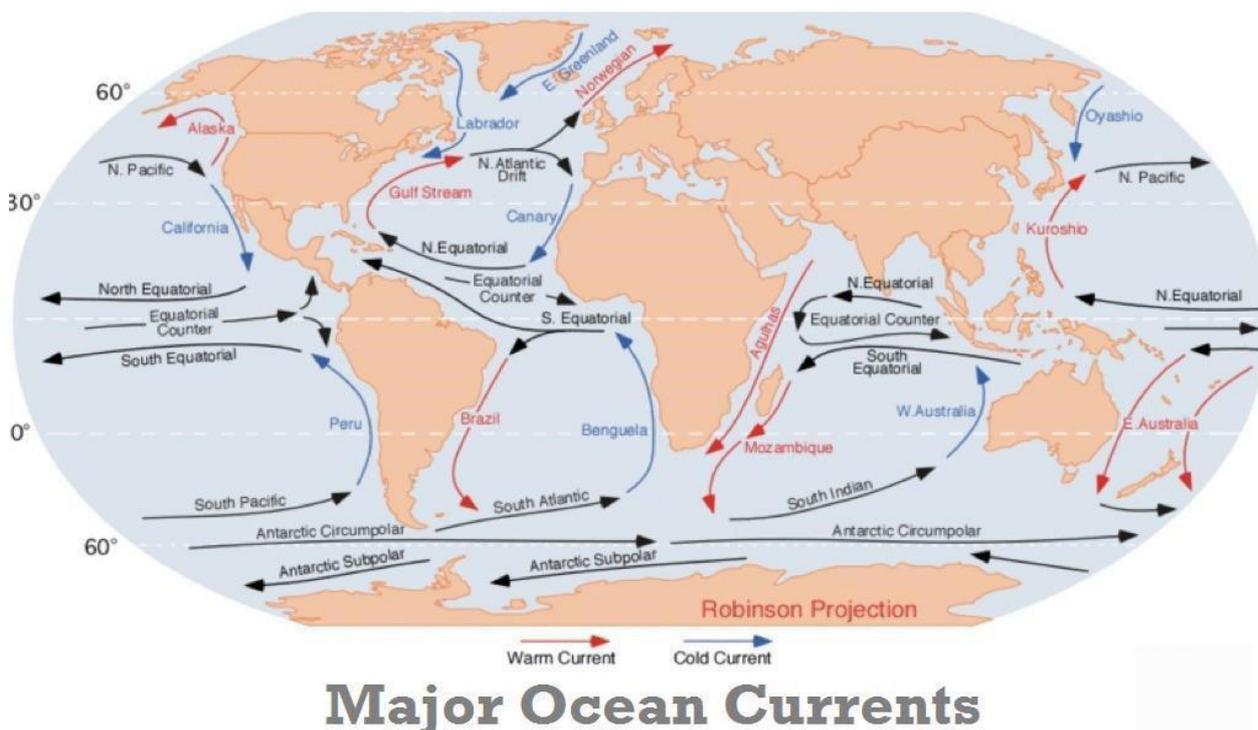


Ocean Currents – Shortcut method by to learn faster



In our [geography notes](#) on the hydrosphere, we have seen the major movements of the ocean water. They are – waves, tides and ocean currents. Having covered the fundamentals, we shall see in this post, a super-fast way to learn the details of ocean currents.

Names, direction, nature...and what not!

Well, you might have heard so many names like Kuroshio current, Oyashio current, Peru current etc. Is Kuroshio a cold current or warm current? Where is its location?

It's not easy to remember all the names, location and type (warm or cold) of ocean currents – without the right guidance. UPSC often ask questions in Prelims and Mains from the topic of ocean currents. So, what is the short-cut approach to learn fast? Well, wait and see.

How to learn the names of ocean currents, faster?

ClearIAS has prepared a mind map from the above map. We have shown the major current systems in the three oceans – Atlantic ocean, Indian ocean and Pacific ocean – from left to right. Continents are represented in 'Green', warm ocean currents in 'Red', and cold ocean currents in 'Blue'. Hope it's easy now!

What are the points to remember?

- There are gyres in each of the oceans – The Pacific, Atlantic and Indian ocean. (Any large system of rotating ocean current, particularly those involved with large wind movements is called as a **Gyre**.)
- **Current direction:** In general, currents in the northern hemisphere travel in the clockwise direction in a gyre, while currents in southern hemisphere travel in the anti-clockwise direction (the only exception is the current direction in the Indian ocean, which changes seasonally.)
- The ocean current movement in the north-Atlantic gyre, as well as north-Pacific gyre, is clockwise, while the gyres in the Southern hemisphere are anti-clockwise. **Current**
- **temperature:** In general, currents in the **western part** of every continent are **cold** (the exceptions are mentioned in the article on movements of the ocean water).
- Currents coming from the **polar region** are generally **cold**.
- Currents **near to equator** are generally **warm**.
- There is a counter-equatorial current, which moves from west to east (warm).
- The west-wind drift moves from west to east (cold)

Now, that's the only quick notes you need to learn the flow pattern of ocean currents. With the above points, you can find the nature of almost all currents. Let's analyse the major ocean currents.

1. North Equatorial Current

- It is a significant Pacific and the Atlantic Ocean current that flows from east to west.
- They flow in between 10⁰ north and 20 north latitudes.
- Despite its name, the North Equatorial Current is not connected to the equator.
- In both oceans, it is separated from the equatorial circulation by the equatorial countercurrent, which flows eastward.

2. South Equatorial Current

- It is a significant ocean current in the Pacific, Atlantic and the Indian Ocean that flows from east to west.
- They flow in between the equator and about 20⁰ south.
- In the Pacific and Atlantic Oceans, it extends across the equator to about 5⁰ north.

3. Equatorial Counter Current

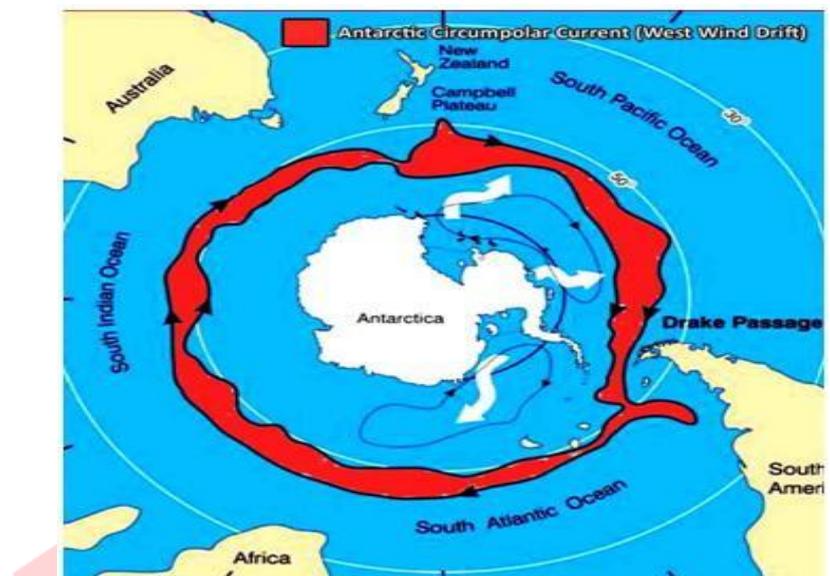
- It is an eastward flowing current found in the Atlantic, Indian and Pacific Oceans.
- It is found in between the North Equatorial and South Equatorial Currents at about 3-10 northern latitudes.
- This counter-current replaces the water removed from the eastern side of the ocean by the North Equatorial and South Equatorial Currents.
- In the Indian Ocean, the current tends to reverse hemispheres seasonally due to the impact of reversing Asian monsoons.

4. Antarctic Circumpolar Current or West Wind Drift

- It is an ocean current that flows from west to east around the Antarctica.
- The current is circumpolar due to the lack of any landmass connecting with the Antarctica and thus keeps warm ocean waters away from the Antarctica.

Also read: Ocean Floor: Everything you need to know

- The Antarctic Convergence is associated with this current. It is the region where the cold Antarctic waters meet the water of the Sub-Antarctic, creating a zone of upwelling (a zone of very high marine productivity).



Gyres of Ocean Currents in each of the major Oceans

The major loops are seen in Pacific Ocean, Atlantic Ocean and the Indian Ocean in both the hemispheres. Each of the currents follows more or less a definite pattern. But the currents in the Indian Ocean (Northern Hemisphere) change the flow-direction between summer and winter.

Currents of the Atlantic Ocean

- To the north and south of the equator, there are two westward moving currents, i.e., the North and the South Equatorial Currents.
- Between these two, there is the counter equatorial current which moves from west to east.

Atlantic Ocean: Northern Hemisphere

- The South Equatorial Current bifurcates into two branches near the Cape De Sao Roque in Brazil and its northern branch joins the North Equatorial Current.
- A part of this combined current enters the Caribbean Sea and the Gulf of Mexico, while the remaining current passes along the eastern side of the West Indies as the
- **Antilles Current.**
- The part of the current which enters the Gulf of Mexico comes out from the Florida Straight and joins the Antilles current.

This combined current moves along the south-eastern coast of the U.S.A and is known as the **Florida Current** up to Cape of Hatteras. Beyond Cape of Hatteras, it is known as the **Gulf Stream**.

- A cold current from the Arctic Ocean called **Labrador Current**, which flows along
- the eastern coast of Canada, meets the warm Gulf Stream near the north-east corner of U.S.A.

The confluence of these two currents, one cold and the other warm, produce fog around the region and makes it the most important fishing ground in the world.

- The Gulf Stream then deflected eastward under the combined influence of the westerlies and the rotation of the earth.
- It then crosses the Atlantic Ocean as the warm North Atlantic Drift.
- In this journey, another cold current from the Arctic called as the East Greenland Current joins with the North Atlantic Drift.
- The North Atlantic Drift bifurcates into two branches on reaching the eastern part of the ocean.
- The northern branch continues as North Atlantic Drift; reaches the British Isles from where it flows along the coast of Norway as the warm **Norwegian Current** and enters the Arctic Ocean.
- The southern branch flows between Spain and Azores Island as the cold **Canaries Current**.
- The Canaries Current finally joins the North Equatorial Current and completes the circuit.

Also read: Soils of India: Classification and Characteristics

Atlantic Ocean: Southern Hemisphere

- The South Equatorial Current turns south and flows along the eastern coast of South America as Brazil Current.
- At about 35 south latitude, due to the influence of westerlies and the rotation of the earth, the current moves eastward.
- A cold current called as the **Falkland Current** which flows along the south-eastern coast of South America from south to north joins with the current at this time.
- The Brazil Current moves eastward and crosses the Atlantic Ocean as **South Atlantic Current**.
- A part of the west wind drift or the Antarctic Circumpolar Current merges with the South Atlantic Current while crossing the Atlantic.
- Near the Cape of Good Hope, the South Atlantic Current is diverted northward as the Cold **Benguela Current**.
- Benguela Current finally joins with the South Equatorial Current and completes the circuit.

Currents of the Pacific Ocean

Pacific Ocean: Northern Hemisphere

- The North Equatorial Current turns northward and flows along the Philippines Islands, Taiwan, and Japan to form the warm **Kuro Shio** or **Kuro Siwo** current.

- Later, a cold current called **Oya Shio** or **Oya Siwo** which flows along the eastern coast of the Kamchatka Peninsula merges with the Kuro Shio Current (Okhotsk Current is a cold current which merges with the Oya Shio before its confluence with Kuro Shio).
- From south-east coast of Japan, the Kuro Shio current comes under the influence of westerlies and flow right across the ocean as the **North Pacific Current**.
- After reaching the west coast of North America, it bifurcates into two branches: the northern branch flows anti-clockwise along the coast of Alaska as warm **Alaska Current** and the southern branch moves southward along the coast of California as the cold **California Current**.
- California Current eventually joins with the North Equatorial Current and completes the circuit.

Pacific Ocean: Southern Hemisphere

- In the South Pacific Ocean, the South Equatorial Current flows towards the west and turns southward as the **East Australian Current**.
- From Tasmania, it flows as the cold **South Pacific Current** from west to east and crosses the Pacific Ocean along with the West Wind Drift.
- On reaching the south-western coast of South America, it turns northward and flows as the cold **Peru Current** or **Humbolt Current**.
- The cold waters of the Peru Current are partially responsible for making the coast of the northern Chile and western Peru with very scanty rainfall.
- Peru Current eventually joins with the South Equatorial Current and completes the circuit.

Also read: Erosion and Deposition: Action of Glaciers

Currents of the Indian Ocean

- The pattern of circulation of ocean currents in the Indian Ocean differs from the general pattern of circulation in the Atlantic and the Pacific Oceans.
- This is because the Indian Ocean is blocked by the continental masses in the north.
- The general pattern of circulation in the southern hemisphere of the Indian Ocean is anti-clockwise as that of the other oceans.
- In the northern hemisphere, there is a clear reversal of currents in the winter and summer seasons, which are completely under the influence of the seasonal changes of monsoon winds.

Indian Ocean: Northern Hemisphere during winter

- During winter, Sri Lanka divides the currents of the Arabian Sea from those of the Bay of Bengal.

- The **North East Monsoon Drift** flows westward just south of Sri Lanka with a countercurrent flow between it and the South Equatorial Current.
- During the winter season, in the northern section, the Bay of Bengal and the Arabian Sea are under the influence of North East Monsoon Winds.
- These North East Monsoon winds drive the waters of the Bay of Bengal and the Arabian Sea westward to circulate in an anti-clockwise direction.

Indian Ocean: Northern Hemisphere during summer

- In summer, the northern part comes under the influence of the South West Monsoon. It results in an easterly movement of water in the Bay of Bengal and the Arabian Sea in a clockwise direction.
- This current is called as the **South West Monsoon Drift**.
- In the Indian Ocean, the summer currents are more regular than those of the winter.

Indian Ocean: Southern Hemisphere

- In the southern part, the South Equatorial Current which flows from east to west is strengthened by its corresponding current of the Pacific Ocean. It then turns southward along the coast of Mozambique in Africa.
- A part of this current moving in between the African mainland and the Mozambique is called as the warm **Mozambique Current**.
- After the confluence of these two parts, the current is called as **Agulhas Current**.
- Agulhas Current merges with the West Wind Drift when it crosses the Indian Ocean.
- A branch of this merged current flows along the western coast of the Australia as cold **West Australian Current**.
- It later joins with the South Equatorial Current to complete the circuit.

Summary

As mentioned above, the quick-way to remember ocean currents is to remember the gyres. Currents in the **western part** of every continent is **cold**. Currents coming from the **polar region** are generally **cold**. Currents **near to equator** are generally **warm**.