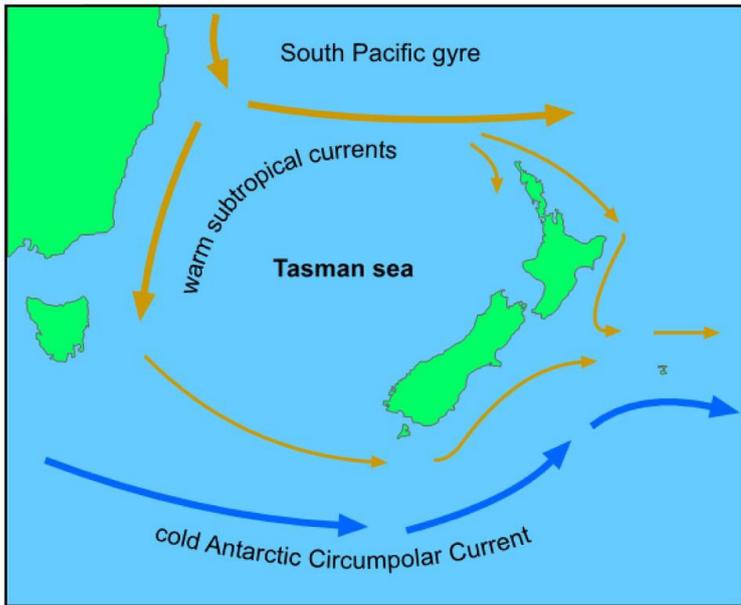


NEW ZEALAND CURRENTS

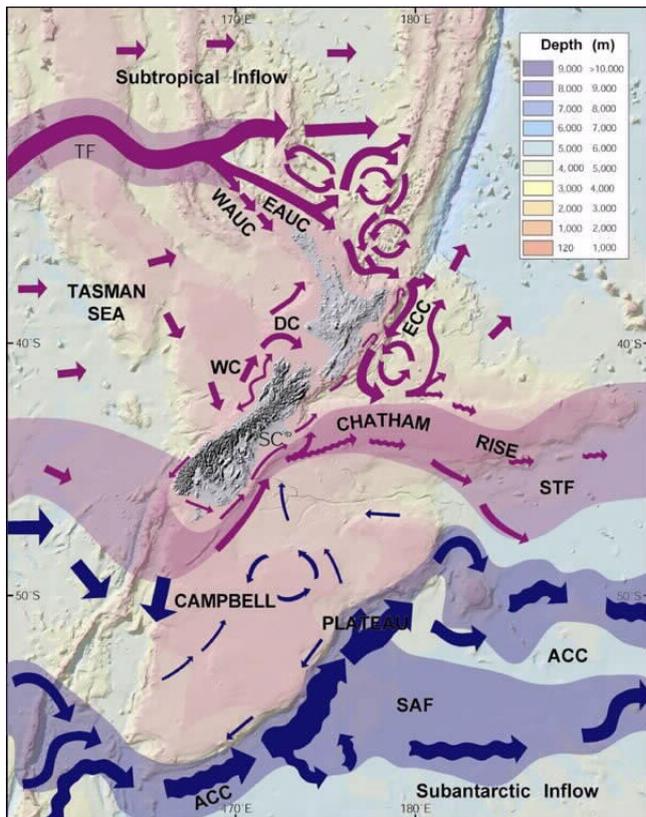
- Waters around the North Island of New Zealand are dominated by warm surface currents that originate from the north of New Zealand off the east coast of Australia.
- The thermal energy carried by these waters originates in the equatorial currents that flow from the east in the South Pacific Gyre. (Equatorial surface waters are subject to intense solar radiation / heating due to the Earth's rotational tilt and the quantity of solar radiation hitting a smaller ocean area.)
- As the warm current flows east along the Equator, it reaches the Australian land mass and is deflected southwards along the east coast of Australia before being influenced by the westerly air flow in the northern Tasman Sea.

To the south of New Zealand, the deep-water current known as the Antarctic Circumpolar Current exists.

This current is linked to the thermohaline circulation. These waters are derived from the sinking of dense saline water in the Antarctic waters. The saline water sinks to the ocean floor and circulates picking up nutrients from the detritus on the ocean floor. As these deep waters circulate along the ocean floor, they encounter land masses which force either a change in direction or an upwelling (upward movement of deep water).



The Antarctic Circumpolar Current flows around the southern part of the New Zealand's South Island, and northwards when it encounters the land mass known as the Chatham Rise. Effectively this is an underwater mountain ridge, and the deep nutrient-rich waters are forced up from depths of 3 km to less than 500 m below sea level.



- The convergence of the two currents in this region allows for the cold nutrient-rich waters to mix with the warm nutrient-poor waters from the north.
- This allows for nutrients to be taken up by the phytoplankton, and this is shown by the phytoplankton bloom recorded by the NASA Earth Observatory project.
- The phytoplankton are the bottom link in the food chain, and the source of food for zooplankton and certain fish species.
- These are in turn a source of food for larger fish species, and the result is large populations of fish in this region.
- The net result is that the Chatham Rise is a rich fishing ground within the New Zealand EEZ, and the source of economic activity for the local population.