

The Beaufort Gyre: collecting heat and fresh water in the ocean

The Beaufort Gyre is a large ocean area where the surface water spins in a circle

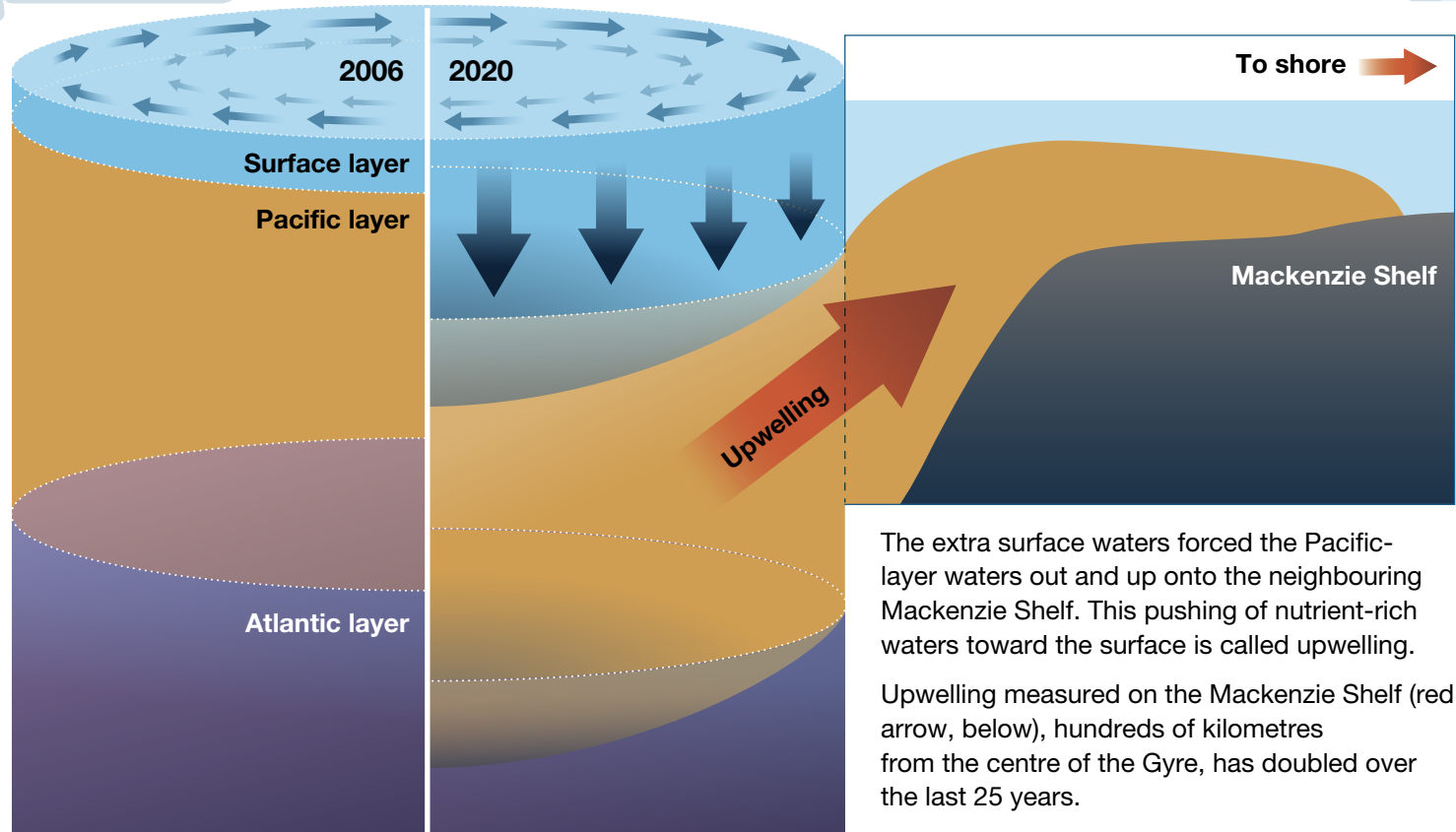
The Beaufort Gyre spins clockwise or counter-clockwise depending on wind patterns.

A faster clockwise spin causes fresh water from ice melt and rivers to accumulate near the surface of the Gyre, pushing the Pacific layer deeper.

Fresh water in the Gyre increased by about 50% from 2003 to 2008.

In the past, the spinning switched direction every 5–10 years. Winds have caused it to spin clockwise on average now since 1997.

If the spinning reverses direction, the accumulated fresh surface water will flow through Canadian Arctic waters to the Atlantic Ocean.

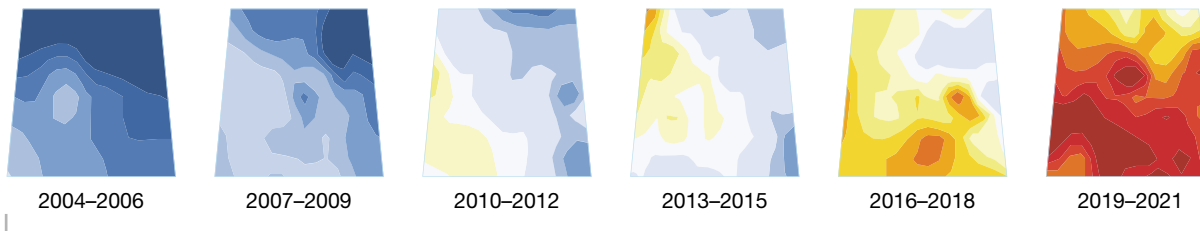


The extra surface waters forced the Pacific-layer waters out and up onto the neighbouring Mackenzie Shelf. This pushing of nutrient-rich waters toward the surface is called upwelling.

Upwelling measured on the Mackenzie Shelf (red arrow, below), hundreds of kilometres from the centre of the Gyre, has doubled over the last 25 years.

Ocean heat in the Pacific layer of the Beaufort Gyre, 2004–2021

Colder Hotter



Since 2004, the average heat in the Pacific layer of the Gyre has increased from 250 to 850 million joules per square metre.

