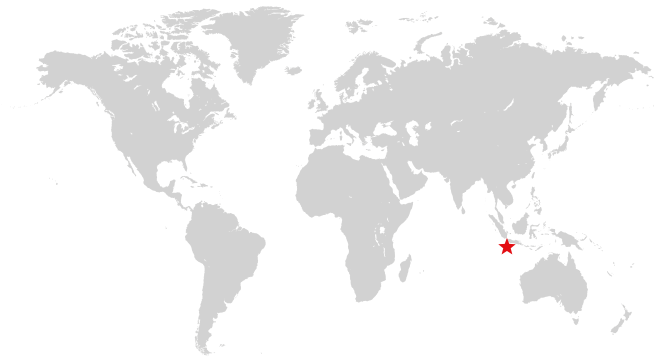




Tea-Colored Rupert Bay Canada

Remote Rupert Bay is a place where the majesty and dynamism of fluid dynamics is regularly on display. With several rivers pouring into this nook of James Bay, the collision of river and sea water combines with the churn of tides and the motion of currents to make swirls of colorful fluid.

As they wind through the boreal forests and wetlands of northern Quebec, the rivers that flow into Rupert Bay carry water stained brown with natural chemical substances found in plants. Tannins and lignins from roots, leaves, seeds, bark, and soil can leach into the water and give it a yellow, brown, or even black color. (The same process gives tea its dark color.) Note that the colored plumes and intricate vortices around the islands are pointing inland—an indicator that the tide was likely coming in, or that northwesterly winds were affecting the flow of the water.



Coral Cocos Indian Ocean

Coral atolls—which are largely composed of huge colonies of tiny animals such as cnidaria—form around islands. After the islands sink, the coral remains, generally forming complete or partial rings. The South Keeling Islands, part of the Cocos Islands in the Indian Ocean, are such a place.

Only some parts of the South Keeling Islands still stand above the water surface. In the north, the ocean overtops the coral. Along the southern rim of this atoll, shallow water appears aquamarine. Water darkens to navy blue as it deepens toward the central lagoon. Above the water line, coconut palms and other plants form a thick carpet of vegetation. Hard and soft corals thrive throughout the reef.



Storms Stir Up Sediment Bermuda

In October 2014, the eye of Hurricane Gonzalo passed right over Bermuda. In the process, the potent storm stirred up the sediments in the shallow bays and lagoons around the island, spreading a huge mass of sediment across the North Atlantic Ocean. This Landsat 8 image shows the area after Gonzalo passed through.

The suspended sediments were likely a combination of beach sand and carbonate sediments from around the shallows and reefs. Coral reefs can produce large amounts of calcium carbonate, which stays on the reef flats (where there are coralline algae that also produce carbonate) and builds up over time to form islands.

Storm-induced export of carbonates into the deep ocean—where they mostly dissolve—is one of the ways that the oceans naturally balance the addition of atmospheric carbon dioxide to ocean waters.