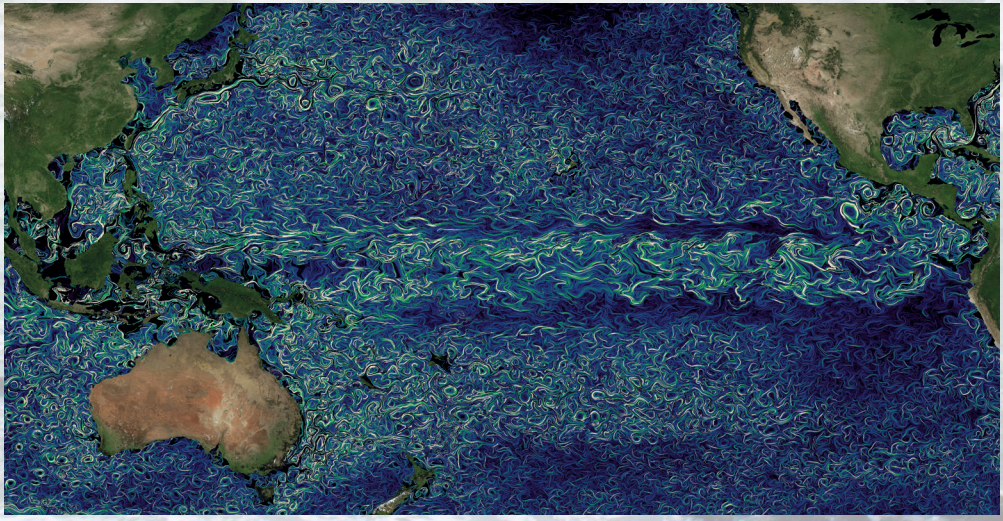
Mesoscale

Mesoscale is a technical term used to describe mid-size ocean phenomena 10 to 100 kilometres across and a few kilometres deep. At this scale, instabilities in ocean currents can generate eddies, a key focus of research as they transport heat, carbon and nutrients between basins. Altimetry data have shown that these processes drive a large portion of lateral transport in the oceans, for example between the Tropics and the Poles. In between two eddies, an intermediate unstable zone appears where vertical heat transfers and carbon exchanges take place. 50 percent of vertical transfers occur through these processes.



Mesoscale eddy structures (Pacific Ocean)

As mesoscale eddies play a pivotal role in the ocean's energy balances, they therefore affect climate and should be studied closely. Recent satellites like SARAL or Sentinel-3 enable these phenomena to be measured in fine and precise detail. They also observe ocean circulation near coasts where a great deal of human activity is concentrated. Research is continuing in eager expectation of the SWOT satellite, which with its radar interferometer will afford a two-dimensional view, marking a vital technological step forward to bring deeper insights into the offshore and near-shore mesoscale structure.