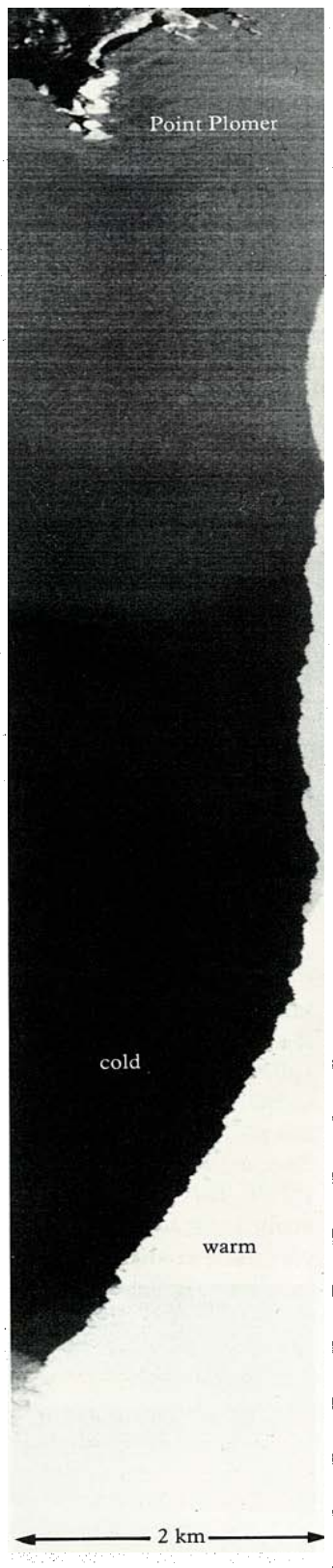
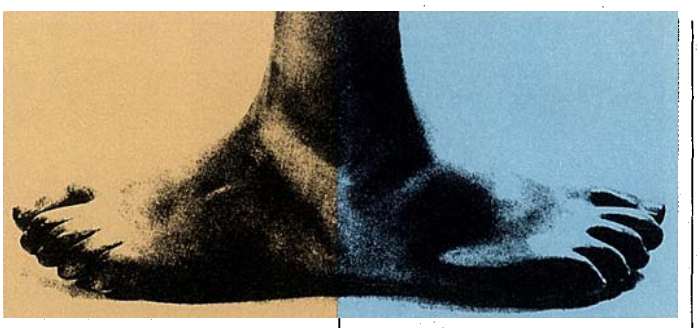
One foot in warm water, the other in cold

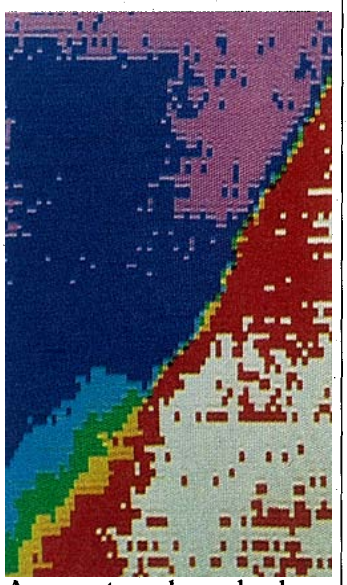


The warm water of the East Australian Current (white) contrasts with adjacent colder water (black) in this infra-red scan of surface temperature.



Mariners sometimes report ocean fronts in waters off New South Wales, which can be followed across the continental shelf and towards the coast.

Colloquially called 'tide lines', the fronts are seen as a distinct change in colour of the water and as an interruption to the normal ocean wave pattern. They



A computer-enhanced colour rendition of the scan shows the sharp boundary of the Current in calibrated form. Each colour step represents 0·3°C.

are manifestations of the East Australian Current, a body of warm water that flows down the eastern coast of Australia and mixes with the colder southern waters. Studies of the Current by the CSIRO Division of Oceanography were reported in *Ecos* 3.

Now, continued study of the Current has shown what a remarkably discrete body of water it is. Dr George Cresswell of the Division has analysed data from ship, satellite, and aircraft, and has found instances where water temperatures at the boundary of the Current may change by more than 2°C over a distance of mere metres.

An instance of this behaviour is shown here. The observation was made from a height of 600 metres by an infra-red scanner aboard an aircraft flying above Point Plomer (31°30′S), near Kempsey, N.S.W. The white area is warm water, the dark is cold. A colour enhancement of this record is also shown.

The Division's research vessel 'Sprightly' was in the area at the time, and its crew could see the blue warmer water and a sharp transition to cooler green water. A line of confused, breaking waves at the boundary is probably the result of current shear.

A satellite overpass at a time close to that of the plane showed clearly that the East Australian Current was separating from the coast at that point.

Earlier studies have shown that Sugarloaf Point (32°30′S), near the Myall Lakes, is a common separation point for the Current. However, it seems that headlands further north can also be important separation points (as in the case here). So, if you are swimming on the northern coast, look for blue water.

Nearshore features of the East Australian Current System. G. R. Cresswell, C. Ellyett, R. Legeckis, and A. F. Pearce. *Australian Journal of Marine and Freshwater Research*, 1982, **33** (in press).