

# Satellite drifter observations on South Africa's Agulhas Bank and their relevance to the dispersion of chokka squid (*Loligo vulgaris reynaudii*) paralarvae — summer 2002/3

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Four satellite drifters were released on the eastern Agulhas Bank to investigate chokka squid paralarvae transport. Two drifters with drogues to 8 m (near-surface) were released directly above a bottom-mounted ADCP (36 m) on the inshore spawning grounds 1.5 km from the Tsitsikamma coast. The other two were released on the mid shelf where squid eggs had previously been found (120 m). One of these was tethered to a drogue at 70 m to monitor flow in the bottom layer. This mid shelf position was also used to release “virtual paralarvae” in a preceding IBM experiment which showed substantial losses from the shelf. Comparison between the ADCP and drifter data showed the drifters to accurately reflect current velocity and direction in the near-surface layer when wind was  $< 4 \text{ m s}^{-1}$ . Inshore transport projections (progressive vector plots) based on the ADCP data were found to be reliably accurate for distances of  $\sim 50 \text{ km}$  on this straight coastline. Both inshore drifters were transported 70 km eastwards in the Tsitsikamma counter current to Tsitsikamma Point. One beached here, the other left the shelf after 20 days. The surface drifter on the mid shelf was transported westward across the central and western Agulhas Bank (550 km) to leave the shelf after 58 days just south of the Cape Peninsula. The deeper drifter also travelled westward, but after 40 days was found well inshore 100 km from the release position. During the study period satellite SST and ocean colour imagery indicated frequent leakage of shelf water near the southern tip of the Agulhas Bank, as well as an intrusion of oceanic water onto the western Bank. The latter caused an anti-cyclonic circulation which led to further leakage of shelf water from the inner central Agulhas Bank. The combination of drifters and satellite imagery used here demonstrated that the retention of chokka squid paralarvae in the Agulhas Bank ecosystem is not guaranteed, even for the inshore spawning grounds. The risk would be less if paralarvae were found near the bottom, but so far sampling indicates they occupy the surface layer.

Key words: satellite drifters, chokka squid, *Loligo vulgaris reynaudii*, transport, Agulhas Bank, shelf water leakage, cold ridge

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