

ABSTRACT

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- Environmental influences on spawning aggregations and jig catches of chokka squid *Loligo Vulgaris Reynaudii*: an *in-situ* study.

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Erratic and highly variable catches in the South African chokka squid *Loligo vulgaris raynaudii* fishery, cause hardship for the industry and uncertainty for resource managers. Catch forecasting can reduce this problem. In this study, hourly data were collected from May 1996 – May 1998 aboard commercial fishing vessels on the inshore spawning grounds, along the south coast of South Africa. The environment-catch relationship was investigated using multiple correlation and regression analysis and analysis of variance. A simple, direct ‘black box’ statistical approach was relatively successful in developing a predictive capability; on an hourly time-scale the regression model accounted for 32% of the variability in catch, with turbidity the determinant (13%).

Seasonal and diel catch variations induced changes in the relative importance of turbidity, water temperature and wind direction on catches. A strong, positive relationship was found between easterly winds (which cause upwelling) and catch, particularly in summer. Catch rates, however decreased with an increase in turbidity. The correlation between temperature and catch was generally negative, however, higher catches were associated with a temperature range of 13 - 18°C. Highest catch rates were associated with easterly winds, zero turbidity conditions and sea surface temperatures from 15.0 – 16.9°C. Selected case studies (*in situ* observations) suggested that upwelling and turbidity events act as environmental triggers for the initiation or termination of the spawning process, respectively. A holistic approach is required to improve predictive capability of chokka squid catch rates.