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Catches of White Sharks in KwaZulu–Natal, South Africa and Environmental Influences

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Introduction

Catches of white sharks *Carcharodon carcharias* in KwaZulu–Natal, formerly known as Natal, are largely confined to the shark nets that protect swimmers against shark attack at more than 40 beaches along the coast (Cliff *et al.*, 1989). The first nets were laid in Durban in 1952, followed by the widespread installation of nets in the mid-1960s. In 1994, a total of 40 km of nets was permanently installed and maintained by the Natal Sharks Board (NSB). Between 1978 and 1993, these nets caught an average of 1354 sharks annually, including 39 white sharks.

White sharks are infrequently caught by recreational anglers in KwaZulu–Natal. These catches are poorly documented, but the most publicized have been those made by anglers from the piers demarcating the entrance to Durban Harbour. Using whale meat as bait, these anglers targeted the large sharks that followed the whale carcasses in tow to the processing factory. The largest white shark, landed in 1953, weighed 754 kg, and the last white shark on record, weighing 234 kg, was landed in 1968 (Mara, 1985). Catches of white sharks by these anglers declined as a result of the cessation of whaling from Durban Harbour in 1976. Consequently, this study is confined to catches of white sharks in the shark nets.

In April 1991, the South African government declared the white shark a protected species, making it illegal to catch or kill any white shark without a permit issued by the Director-General of Environment Affairs (Compagno, 1991). This was preemptive legislation to allow the scientific community time to assess the stocks of white sharks along the coast and the impact of fishing-induced mortality. At present, the shark net catches provide the only long-term index of changes in white shark stocks in southern Africa. This chapter examines trends in the catch rates of white sharks in the shark nets from 1966 to 1993.

A relationship between white shark catch rates and environmental parameters, including El Niño–Southern Oscillation (ENSO), is investigated. In its warm phase, or El Niño, ENSO leads to decreased summer rainfall and increased westerly wind flow in southern Africa (Lindesay, 1988). Increased easterly winds and summer rainfall and reduced coastal sea-surface temperatures (SSTs) are associated with the cold phase, or La Niña (Schumann *et al.*, 1996).

Cliff *et al.* (1989) described the general biology of 429 white sharks caught in the nets between 1978 and 1988. The length–mass and length–length equations published by these authors are improved in this chap-