Conditions determine sharks' presence in Gansbaai

Findings published in a new scientific article have revealed that Great White sharks may time their visits to particular regions when the conditions are optimal for their own physiology, or for their prey species.

The research focused on environmental influences on Great White sharks especially in the Gansbaai area.

"Our latest study looks into the driving factors and cues behind white shark presence in Gansbaai," says Dyer Island Conservation Trust's (DICT) marine biologist Alison Towner, author of the latest paper. "The predator's distribution is commonly associated with seasonal prey availability, such as Cape fur seal pups. However, environmental conditions are known to vary dramatically in this important aggregation site. Interestingly, we picked up on a strong trend showing that climatic phase may influence the sexual composition of sharks utilising the bay."

The southern oscillation index (often referred to as El Nino and La Nina) are climatic fluctuations occurring every three to seven years and influencing weather patterns globally. The effects of such events have been linked to rainfall and sea surface temperatures in the Southern and Western Cape and published studies exist on marine species such as anchovy, sardine and squid. The DICT's latest study is the first to link these features with white shark presence in South Africa.

Cooler water is preferred

The work was made possible by the unique consistency in data collection over five years on the Marine Dynamics commercial boat, combined with the presence of a strong La Nina event in the latter half of the study period. The presence of male sharks was significantly correlated with this, implying that cooler water conditions were a preferred window period for male sharks utilising the inshore region of Gansbaai.

"Sexual segregation also occurs in the species, which may be linked to mating avoidance or reduced competition for

resources. The information from this study is important for managing white shark presence inshore as it can be used to predicatively model high risk areas and times for bather safety," says Towner.

This study, agrees with other work published from South Australia and Cape Town showing seasonal water temperature effects on white shark abundance. Gansbaai lies just 120 km to the east of Cape Town, yet the regions often exhibit contrasting water conditions, due to orientation of the two bays and differing lag effects on cold water upwelling.

Nuclear station

"I am very excited about this study, as the new information can help us manage and protect Great White sharks better," says Wilfred Chivell, founder and chair of the board of Trustees of the DICT. The team's previous study came out in July, and was the first open population estimate of Great White sharks in the region, concluding that numbers could be 50% lower than expected.

Eskom have proposed the building of a nuclear power station on the edge of Gansbaai. Their environmental impact assessment states that a localised water temperature increase around the outlet plume is not a concern as white sharks should not be affected. "Our studies suggest the opposite," says Towner. "Water temperature plays a more important role in white shark habitat use than previously thought. This is a protected shark species in South Africa and Gansbaai is a critical aggregation site for white sharks. Coastal development should be very carefully considered, especially if it alters regional water conditions at these sites."