

South Africa's great white sharks are changing locations—they need to be monitored for beach safety and conservation

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Great white shark (*Carcharodon carcharias*) off South Africa. Image: Hermanus Backpackers, via Wikipedia.

South Africa is renowned for having one of the world's biggest populations of great white sharks (*Carcharodon carcharias*). Substantial [declines](#) have been observed, however, in places where the sharks normally gather on the coast of the Western Cape province. Sharks congregate at these locations to feed, interact socially, or rest.

In Cape Town, skilled "[shark spotters](#)" documented a peak of over 300 great white shark sightings across eight beaches in 2011, but have recorded no sightings since 2019. These declines have sparked concerns

about the overall conservation status of the species.

Conserving [great white sharks](#) is vital because they have a pivotal role in [marine ecosystems](#). As top predators, they help maintain the health and balance of marine food webs. Their presence influences the behavior of other marine animals, affecting the entire ecosystem's structure and stability.

Marine biologists like us needed to know whether the decline in shark numbers in the Western Cape indicated changes in the whole South African population or whether the sharks had moved to a different location.

To investigate this problem, we undertook an extensive [study](#) using data collected by scientists, tour operators and shore anglers. We examined the trends over time in abundance and shifts in distribution across the sharks' South African range.

Our investigation revealed significant differences in the abundance at primary gathering sites. There were declines at some locations; others showed increases or stability. Overall, there appears to be a stable trend. This suggests that white shark numbers have remained constant since they were given protection in 1991.

Looking at the potential change in the distribution of sharks between locations, we discovered a shift in human-shark interactions from the Western Cape to the Eastern Cape. More research is required to be sure whether the sharks that vanished from the Western Cape are the same sharks documented along the Eastern Cape.

The stable population of white sharks is reassuring, but the distribution shift introduces its own challenges, such as the risk posed by fisheries, and the need for beach management. So there is a need for better

monitoring of where the sharks are.

Factors influencing shark movements

We recorded the biggest changes between 2015 and 2020. For example, at Seal Island, False Bay (Western Cape), shark sightings declined from 2.5 sightings per hour in 2005 to 0.6 in 2017. Shifting eastward to Algoa Bay, in 2013, shore anglers caught only six individual sharks. By 2019, this figure had risen to 59.

The changes at each site are complex, however. Understanding the patterns remains challenging.

These predators can live for more than 70 years. Each life stage comes with [distinct behaviours](#): juveniles, especially males, tend to stay close to the coastline, while sub-adults and adults, particularly females, venture offshore.

[Environmental factors](#) like [water temperature](#), lunar phase, season and food availability further influence their movement patterns.

Changes in the climate and ocean over extended periods might also come into [play](#).

As adaptable predators, they target a wide range of prey and thrive in a broad range of temperatures, with a preference for 14–24°C. Their migratory nature allows them to seek optimal conditions when faced with unfavorable environments.

Predation of sharks by killer whales

The movement complexity deepens with the involvement of [specialist](#)

[killer whales with a taste for shark livers](#). Recently, these [apex predators](#) have been observed preying on white, sevengill and bronze whaler sharks.

Cases were first documented in 2015 along the South African coast, coinciding with significant behavioral shifts in white sharks within Gansbaai and False Bay.

Although a direct cause-and-effect link is not firmly established, observations and tracking data support the notion of a distinct [flight response](#) among white sharks following confirmed predation incidents.

More recently, it was clear that in [Mossel Bay](#), when a killer whale pod killed at least three white sharks, the remaining sharks were prompted to leave the area.

Survival and conservation of sharks

The risk landscape for white sharks is complex. A [study](#) published in 2022 showed a notable overlap of white sharks with longline and gillnet fisheries, extending across 25% of South Africa's Exclusive Economic Zone. The sharks spent 15% of their time exposed to these fisheries.

The highest white shark catches were reported in KwaZulu-Natal, averaging around 32 per year. This emphasized the need to combine shark movement with reliable catch records to assess risks to shark populations.

As shark movement patterns shift eastward, the potential change in risk must be considered. Increased overlap between white sharks, shark nets, drumlines (baited hooks) and gillnets might increase the likelihood of captures.

Beach safety and management adaptation

Although shark bites remain a [low risk](#), changing shark movements could also influence beach safety. The presence of sharks can influence human activities, particularly in popular swimming and water sports areas. Adjusting existing shark management strategies might be necessary as distributions change.

Increased signage, temporary beach closures, or improved education about shark behavior might be needed.

In Cape Town, for example, [shark spotters](#) have adjusted their efforts on specific beaches. Following two [fatal shark incidents](#) in 2022, their program expanded to [Plettenberg Bay](#). Anecdotal evidence highlights additional Eastern Cape locations where surfers and divers encounter more white sharks than before.

Enhanced monitoring and long-term programs

Further research is required to understand the factors behind the movements of [sharks](#) and their impact on distribution over space and time. Our study underscores the importance of standardizing data collection methods to generate reliable abundance statistics across their entire range. Other countries suffer from the same problem.

Additionally, we propose establishing long-term monitoring programs along the Eastern Cape and continuing work to reduce the number of shark deaths.

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