

Geographic Profiling of White Shark Predation

R. Aidan Martin[†], D. Kim Rossmo^{††}, *Neil Hammerschlag[‡]

[†] *Fish Museum, Zoology Department, University of British Columbia, Vancouver, British Columbia, V7X 1A3, Canada*

^{††} *Department of Criminal Justice, Texas State University-San Marcos, San Marcos, Texas, 78666, USA*

[‡] *Pew Institute for Ocean Science, Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida, 33149, USA*

e-mail: ram@elasm-research.org

*Presenter

Stalking predators must balance minimum strike distance against the need to maintain crypsis. White sharks (*Carcharodon carcharias*) aggregate seasonally off Seal Island, South Africa, where they stalk and attack Cape fur seals (CFS, *Arctocephalus pusillus pusillus*). White sharks typically attack CFS at the surface via a sudden vertical strike, a strategy which maximises their ability to spot prey silhouetted in Snell's window and minimises strike distance and duration while limiting preys' ability to detect, assess, and escape attack. White shark attacks on CFS at Seal Island are concentrated at the seals' primary entry-exit point, but it is not known whether sharks search randomly or limit their search to areas adjacent to prey entry-exit points. Direct observation of white sharks near Seal Island is difficult, due to water turbidity and low crepuscular light levels, when predatory activity is greatest. Geographic profiling was used to show that white sharks hunting CFS at Seal Island do not search randomly around the island or at the primary entry-exit point, where prey concentration is highest. Instead, white sharks appear to concentrate hunting effort to an area seaward of the entry-exit point along the travel path seals follow to and from the island. Our results suggest that hunting strategy of white sharks exhibit optimal exploitation strategies.