UCT-SANCOR Seminar

Join us for this double feature by visiting researchers from the University of Las Palmas de Gran Canaria, Spain

Berta Pérez

Using white shark movement to understand oceanographic environments and behavioural responses

Marco León

White Sharks as Ocean Gliders: Assessing their role in improving monitoring and ecosystem management of the Greater Agulhas Current System.

Monday, 8 June 2026

13h00 SAST

UCT Oceanography Seminar Room or Online

Image by Morne Hardenberg

Using white shark movement to understand oceanographic environments and behavioural responses

By
Berta Pérez
University of Las Palmas de Gran Canaria,Spain

Overview

Understanding the environmental drivers of apex predator movement is critical to predict ecosystem responses in a changing ocean. Here, we investigate how oceanographic conditions influence the movement behaviour of white sharks (*Carcharodon carcharias*) across coastal and offshore environments off South Africa.

We analysed satellite tracking data from 33 individuals (2012–2014) using a two-state Hidden Markov Model to classify movements into resident and transient behavioural modes. Environmental variables, including sea surface temperature (SST), chlorophyll-a concentration, dissolved oxygen, current speed, and bathymetry, were matched to shark positions, and their influence on movement behaviour was assessed using Generalized Linear Mixed Models.

Warmer SST and stronger currents were associated with increased transient behaviour, while higher chlorophyll-a concentrations and dissolved oxygen levels promoted resident states. Sharks exhibited more transient movements in offshore waters, suggesting lower habitat retention compared to coastal regions. Results also indicate that major oceanographic fronts, such as the Subtropical Front, may constrain movement and act as ecological boundaries. These findings highlight the role of multi-scale oceanographic processes in shaping white shark movement and suggest that climate-driven changes in ocean structure may alter habitat use and connectivity in this apex predator.

About the speaker

Berta is a Marine Sciences graduate originally from Barcelona, Spain, with a Master's degree in Oceanography from the University of Las Palmas de Gran Canaria and a multidisciplinary background spanning shallow seas, continental margins, and deep-ocean environments. Experienced in animal telemetry, satellite data analysis, and ecological modelling, with work focusing on white shark movement ecology, marine turtles, and oceanographic studies using animal-borne sensors, Argo floats, and satellite observations. Currently based in Cape Town, South Africa, working on a research paper investigating white shark behaviour within the Greater Agulhas Current System.

White Sharks as Ocean Gliders: Assessing their role in improving monitoring and ecosystem management of the Greater Agulhas Current System.

By
Marco León
University of Las Palmas de Gran Canaria,Spain

Overview

The Greater Agulhas Current System (GACS) connects the Indian and Atlantic oceans, playing a key role in regional and global ocean dynamics with implications for climate and marine ecosystems. Thus, capturing the structure and variability of the GACS requires approaches that expand ocean observations across space and time. Here, we evaluate the potential of white sharks (*Carcharodon carcharias*) as mobile platforms for ocean data collection, providing a complementary source of in situ observations that can augment existing observing systems while offering insight into the physical environments they inhabit. Three individuals equipped with Pop-up Archival Transmitting (PAT) tags collected temperature and depth between 2012 and 2015 across coastal and offshore regions of the GACS. Shark-derived temperature measurements showed strong agreement with satellite-derived sea surface temperature and reanalysis outputs. However, satellite and reanalysis performance degraded in coastal regions (<50 km from shore), where shark observations provided in situ measurements unaffected by environmental interference. Vertical temperature profiles revealed discrepancies with reanalysis models of up to ±4 °C in regions of strong stratification and frontal activity, highlighting limitations in resolving fine-scale thermal structure. These results demonstrate the potential of biologging data from white sharks to support ocean monitoring and model evaluation in dynamically complex environments.

About the speaker

Marco is from Cuba and is currently doing a PhD in Spain about physical drivers and connectivity of megafauna distribution in the Southwest Indian Ocean using animal telemetry and oceanographic data.