

Predation of Silky Sharks in the Northern Gulf of Mexico

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The silky shark (*Carcharhinus falciformis*) is a common pelagic species found in the northern Gulf of Mexico and is considered

circumglobal, epipelagic, and highly migratory. Recent assessments of silky sharks in this region demonstrated a sharp decline in numbers over the past 30 years. This decline, in conjunction with their slow growth, late age of maturity, and low fecundity rates, has raised concerns about the silky shark's status. In turn, National Oceanographic and Atmospheric Administration (NOAA) Fisheries has designated silky sharks in the south Atlantic region as a 'prohibited' species.

Researchers at The University of Southern Mississippi's Gulf Coast Research Laboratory are

conducting a study (funded by NOAA Fisheries) to investigate the movement patterns and habitat preferences of silky, as well as dusky sharks (*C. obscurus*, also listed as 'prohibited'), in the northern Gulf of Mexico. In 2008, pop-up satellite archival tags (PSATs) were deployed on six silky sharks (1.3-1.8 m, TL). Archived data revealed that these sharks typically spent the majority of their time (99%) in the top 50m of the water column and made a few rare dives below 50m.

However, two of the tagged silky sharks exhibited a rather dramatic change in vertical behavioral patterns weeks after tagging (See Depth Profile). At this point only 5% of their time was spent above 50m and 95% of their time was spent between 50 and 300m. Additionally, each shark exhibited a strong diel pattern of excursions to nearly 300m during the day returning to within 50m at night. The temperature readings during these diving events surprisingly remained relatively constant, near 25°C, changing only slightly (~1°C) with the most drastic depth changes. Furthermore, the two PSATs recorded no times for sunrise or sunset. This altered behavior continued for 14 and 6 days for the two sharks,

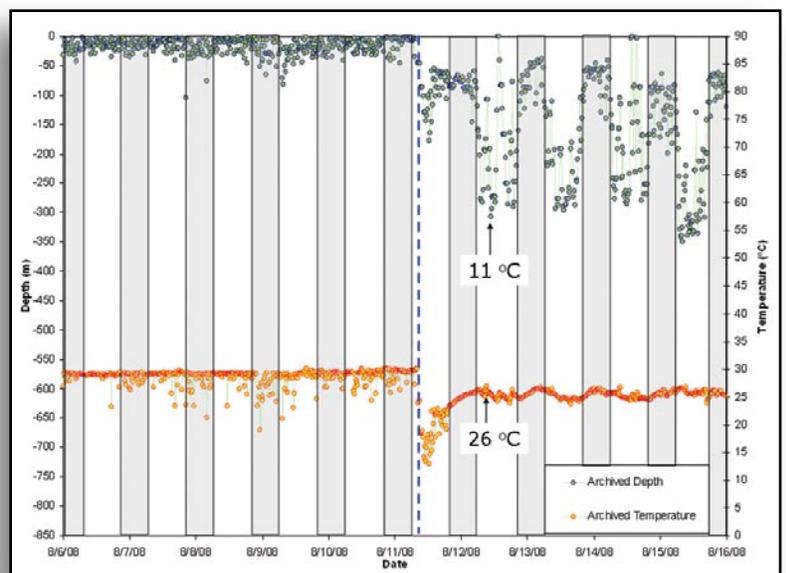
at which time each tag prematurely released and came to the surface.

Taken in total, these data suggest that the two silky sharks were consumed by a larger predator, most likely a shark. The lack of archived sunset/sunrise times indicates that each tag's light sensor was in complete darkness, possibly in the stomach of the predator. The tags were then regurgitated by the predator after the respective 14 and 6 days, and then floated to the surface where they transmitted within 4 days. The constant temperature and large thermal inertia reported by the PSATs at depth (~14-15°C warmer than the temperature of the surrounding water) implies a large, endothermic predator. Only two shark species in the Gulf of Mexico exhibit this type of endothermy: shortfin mako (*Isurus oxyrinchus*) and white (*Carcharodon carcharias*) sharks. Based on the extremely low abundance of white sharks in the Gulf of Mexico and the distinct diel vertical behavior (common to makos) recorded by the PSATs, it is believed that the silky sharks were preyed upon by large shortfin mako sharks.



Photo by Jim Franks

Dr. Eric Hoffmayer tagging a silky shark in northern Gulf of Mexico waters.



A 10 day depth and temperature profile (tag ID 85217) that demonstrates a silky shark possibly being consumed by a shortfin mako shark. Gray bars indicate night. Blue dashed line indicates the point at which the predation event is thought to have occurred. The profile to the left of the dashed line describes the silky shark behavior, whereas the profile to the right of the dashed line describes the diel vertical behavior and stomach temperature of the mako shark. The two noted temperatures describe the temperature at 350m and the corresponding stomach temperature. The silky shark was tagged on 7/18/2008 and recorded data for 25 days before the predation event.

Bits & Pieces



Argos has updated its Location Class Accuracy definitions—check out the FAQs on their website (<http://www.clsamerica.com/argos-system/faq.html>) for details.

Have you upgraded to Google Earth™ 5.0? You'll need the latest version of our GPS parsing software. Please contact us for download instructions.

Microwave Telemetry, Inc. will be closed from July 3 through July 10 for our biennial retreat; we will reopen for business Monday July 13.

Abstracts of presentations at our conference are now posted on our website.

A gentle reminder to our customers: please follow up with your accounts payable colleagues, to eliminate the surprise when interest is added to overdue invoices.