

Effects of climatic variability on the feeding behaviour of hammerhead sharks in the Galapagos Islands



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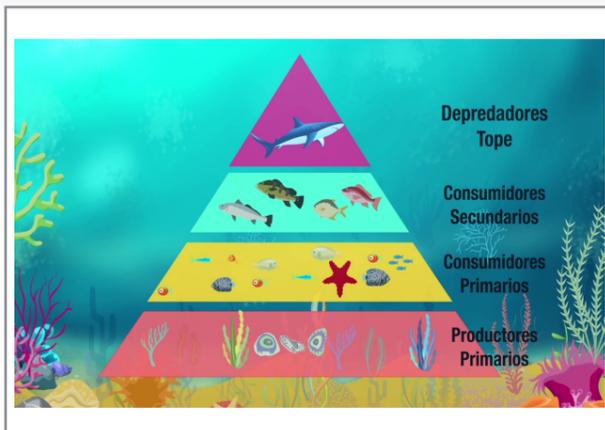
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Top predators

Most of the sharks are top predators that are located at the top of the trophic chain and through their feeding behaviour maintain the health of marine ecosystems.

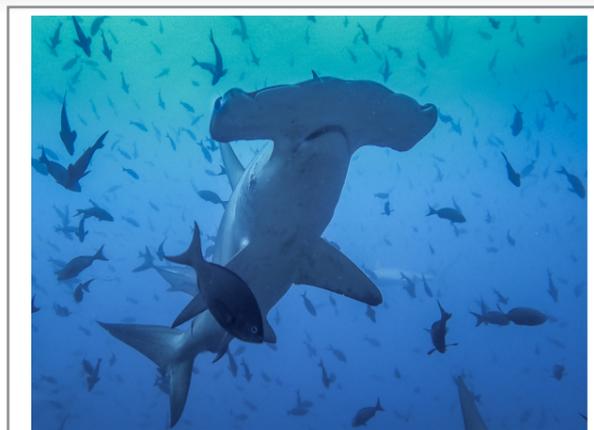
(Myers & Worm 2003)



Galapagos Marine Reserve

The GMR is a refuge for various shark species, reporting the largest global shark biomass on Darwin and Wolf islands.

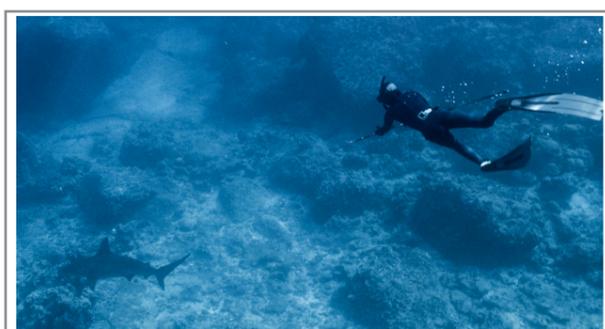
(Salinas de León et al., 2016)



Hammerhead shark

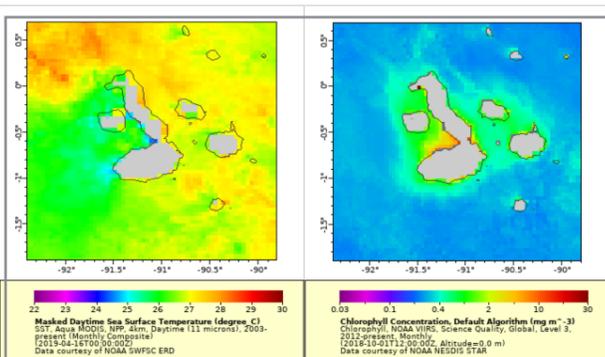
The hammerhead shark, *Sphyrna lewini*, is an iconic species of the Galápagos Marine Reserve that is globally Endangered (IUCN) due to overfishing and climate change.

(Myers & Worm 2003)



Feeding behaviour

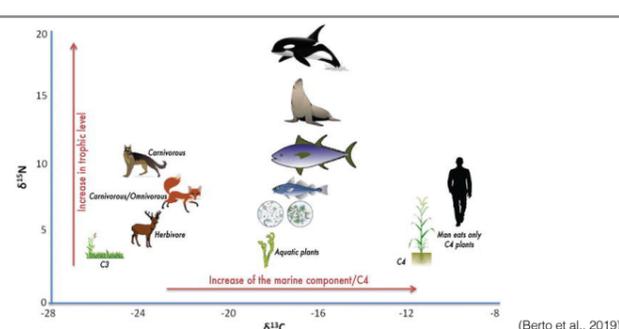
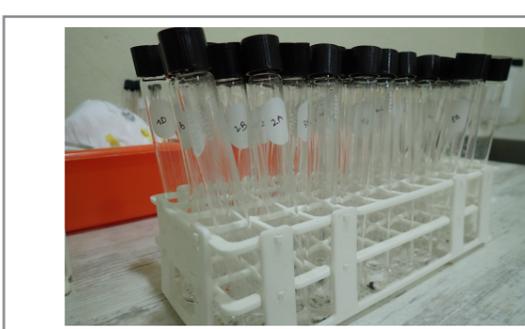
To determine their feeding strategies, we collected biopsies of adults and juveniles hammerhead sharks (*Sphyrna lewini*) using a Hawaiian sling *in situ* during the years 2016-2019.



El Niño (ENSO)

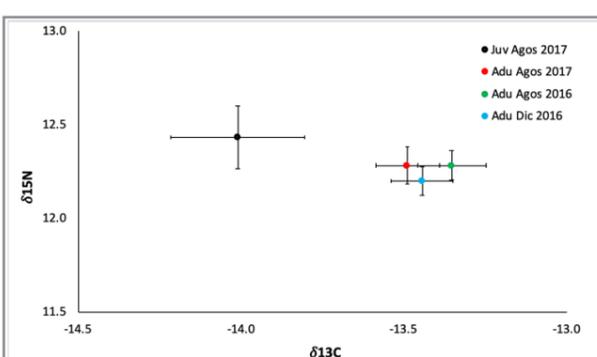
The Eastern Tropical Pacific is highly affected by El Niño events that causes extreme climatic variability, increasing the temperature of the water and reducing the levels of marine productivity.

(Wang & Fiedler 2006)



Stable Isotope Analysis

We analysed the carbon and nitrogen isotopic signals ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) present in the muscle of the sharks to determine their feeding behaviour. The values of $\delta^{13}\text{C}$ indicate the energy flow across the food web, while the values of $\delta^{15}\text{N}$ reveal information on the shark's trophic position.



Preliminary results

There are ontogenetic changes in which adults do not change their trophic strategies over time, while juveniles do alter their feeding strategy.

(Páez-Rosas et al. unpublished data)



Acknowledgments

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References:

- Salinas de León P, Acuña-Marrero D, Rastoin E, et al (2016) Largest global shark biomass found in the northern Galápagos Islands of Darwin and Wolf. PeerJ 4:e1911.
- Myers RA, Worm B (2003) Rapid worldwide depletion of predatory fish communities. Lett to Nat 423:280-283
- Wang C, Fiedler PC (2006) ENSO variability and the eastern tropical Pacific: A review. Prog Oceanogr 69:239-266.