

Northern Galapagos Islands home to world's largest shark biomass

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A natural rock formation known as "Darwin's Arch" protrudes from the water southeast of Darwin Island. The waters around the small, remote islands of Darwin and Wolf contain the largest biomass of sharks on the planet. Credit: Neil Gelinas/National Geographic, from 'National Geographic Pristine Seas'

In a study published today in the journal *PeerJ*, scientists from the Charles Darwin Research Station (CDRS) and the National Geographic Society revealed that the northern Galapagos islands of Darwin and Wolf

are home to the largest shark biomass reported to date (12.4 tons per hectare).

Worldwide, overfishing has reduced the biomass of most sharks and other large predatory fishes by more than 90 percent—even in remote areas. The findings detailed by CDRS and National Geographic Society researchers in *PeerJ* are significant because the presence of these top predators indicates a healthy marine ecosystem. Moreover, the data amassed over two years of rigorous research will add to a growing body of literature about the role of top predators in marine ecosystems.

"The islands of Darwin and Wolf are jewels in the crown of the Galapagos because of the sheer abundance of sharks and other top predators," said Pelayo Salinas de Leon, the paper's lead author and senior marine ecologist at CDRS.

Despite the large shark biomass, the abundance of reef fishes in this area has been severely reduced because of excessive fishing. The area was not fully protected from fishing until the Ecuadorian government announced the creation of a marine sanctuary around Darwin and Wolf in March 2016. Given how important the Galapagos are to Ecuador's tourism industry and to the well-being of these top predators, the paper's authors urge strong enforcement of the new marine sanctuary.



A group of hammerhead sharks swims over the sandy seafloor populated with garden eels at Darwin Island. These sharks are known for their ability to make sudden and sharp turns as the unique wide-set placement of their eyes allows them a vertical 360-degree view, which is ideal for stalking their prey. Credit: Enric Sala/National Geographic, from 'National Geographic Pristine Seas'

"Charles Darwin made the Galapagos Islands famous, but for the underwater world to be so full of life is something he probably never imagined," said Enric Sala, National Geographic Society Explorer-in-Residence and leader of the Society's Pristine Seas project.

The National Geographic Society conducted a Pristine Seas expedition in the Galapagos Marine Reserve in December 2015. Led by Sala, the Pristine Seas team of international scientists and filmmakers, in

collaboration with the Galapagos National Park and CDRS, surveyed and documented the waters around the islands, with a focus on the deep and offshore environments. The expedition, made possible in part by a grant from The Leona M. and Harry B. Helmsley Charitable Trust, helped inform the government's decision to create the new sanctuary around Darwin and Wolf.

The shark biomass research team collected data using stereo-video surveys at seven sites in collaboration with the Galapagos National Park Directorate. The quantitative surveys recorded at Darwin and Wolf are considerably larger than those reported at Costa Rica's Cocos Island National Park and the Chagos Marine Reserve in the Indian Ocean, home to the world's next largest shark biomasses.

According to the CDRS and National Geographic Society scientists: "The study published today adds to the growing body of literature highlighting the ecological uniqueness and the irreplaceable value of Darwin and Wolf—not only for Ecuador but for the world."

More information: Pelayo Salinas de León et al, Largest global shark biomass found in the northern Galápagos Islands of Darwin and Wolf, *PeerJ* (2016). [DOI: 10.7717/peerj.1911](https://doi.org/10.7717/peerj.1911)

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