

Bridging archaeology and marine conservation in the South Atlantic Ocean

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The marine ecosystems of the South Atlantic Ocean have experienced a significant decline in recent decades due to overfishing and habitat degradation. This is demonstrated by a scientific study led by the

Institute of Environmental Science and Technology of the Universitat Autònoma de Barcelona (ICTA-UAB) that sheds light on the magnitude of human impact on these once thriving marine areas based on the archaeological analysis of fish remains from several sites in Brazil.

The Indigenous communities that inhabited the southern coast of Brazil for thousands of years enjoyed abundant and diverse marine ecosystems teeming with large, high trophic level fish and top predators that played an important role in their food security in the past. This allowed their periodic exploitation by Indigenous populations with simple fishing technology for thousands of years.

After comparing the archaeological remains of fish species from the past with the present-day fish populations, the results show a significant decrease in many of the species, particularly sharks and rays, possibly linked to the escalating human impacts, such as overfishing and habitat degradation in recent decades.

Thiago Fossile, lead author and researcher at ICTA-UAB and the UAB Department of Prehistory, emphasizes the growing anthropogenic pressures faced by aquatic fauna in Brazil, a country known for its stunning beaches and diverse wildlife. "Many species documented in [archaeological sites](#) are now endangered, while for other species there is insufficient data on their distribution and abundance. By using [archaeological data](#), we can gain insight into these lost environments and can redefine conservation baselines."

André Colonese, senior author of the study and researcher at ICTA-UAB and the Department of Prehistory at UAB, highlights the importance of coastal and marine ecosystems in sustaining subsistence fisheries for thousands of years along the Brazilian coast. "Hundreds of archaeological sites provide valuable information on past biodiversity, contributing to discussions on fisheries management and conservation.

This study emphasizes the significance of incorporating archaeological data into conservation debates in Brazil, enhancing the discipline's relevance to environmental issues."

For Mariana Bender, co-author from the Universidade Federal de Santa Maria, the study offers a new perspective into the understanding of the exploitation of fish biodiversity through time. "It is amazing what archaeological sites can tell us relative to the impacts of ancient human populations on fish biodiversity. Looking at [fish](#) characteristics we found evidence that large top predators have long been exploited and recent fisheries have moved towards lower trophic levels. This process is not recent, but instead, has been in place for thousands of years," she says.

Co-author Dione Bandeira of the Universidade da Região de Joinville (Brazil) explained, "Indigenous environmental stewardship serves as a model for sustainable resource utilization and plays a crucial role in conserving biodiversity in tropical and subtropical regions of South America. Additionally, studies focusing on archaeological faunal remains provide valuable insights into the origins and evolution of these enduring practices."

The study is published in the journal *PLOS ONE*.

More information: Thiago Fossile et al, Bridging archaeology and marine conservation in the Neotropics, *PLOS ONE* (2023). [DOI: 10.1371/journal.pone.0285951](https://doi.org/10.1371/journal.pone.0285951)

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