Whale shark fringe migration

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At the fringe of the whale shark range, the volcanic Azore islands may play an increasing role for the north Atlantic population as sea surface temperatures rise, according to a study published July 16, 2014 in the open-access journal *PLOS ONE* by Pedro Afonso from University of the Azores and colleagues.

Whale sharks prefer tropical waters in the range of 26-30º C, but studies have shown that this large filter-feeding shark seasonally aggregates at highly productive coastal sites, sometimes at the edge of their preferred water temperature range. Whale sharks have been sighted around the Azores, a region in Portugal composed of nine volcanic islands in the mid-North Atlantic, even though they lie on the edge of the whale shark ocean temperature range. To better understand their appearance around the islands, scientists in this study analyzed a 16-year (1998-2013) observer dataset from the pole-and-line tuna fishery around the Azores and used models to investigate the spatial and temporal patterns of whale shark occurrence in relation to oceanographic features, such as food, sea surface temperature, and seafloor features.

During this period, the researchers observed an increase in whale shark sightings in 2008, followed by increased regularity of sightings for the remainder of the study period. The authors found that sea surface temperature helped predict whale shark occurrences in the region. For example, the higher water temperature around the island of Santa Maria correlated with a pattern of more frequent whale shark sightings in the area. Whale shark sightings were also higher in areas of increased seafloor slope and closer to the seamounts; these seafloor features

coincided with large amounts of chlorophyll-a, a type of whale shark food. The authors suggest that the Azores region integrates the oceanic features necessary for a thriving adult whale shark habitat, and that the area may eventually become more important for the Atlantic whale shark population in face of climate change.

More information: Afonso P, McGinty N, Machete M (2014) Dynamics of Whale Shark Occurrence at Their Fringe Oceanic Habitat. *PLoS ONE* 9(7): e102060. DOI: 10.1371/journal.pone.0102060