

# Movements and connectivity of coral-associated sharks in the northeast Caribbean.

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World-wide most reef-associated shark populations have strongly declined, mainly due to fisheries and habitat degradation. In large parts of the Caribbean, status and movement ecology of shark species that use coral reefs during at least one life stage still remain largely unknown. This lack of baseline knowledge hampers to evaluate measures taken to protect coral reefs, such as marine protected areas and fisheries regulations, on reef associated shark populations. This study focuses on tracking individual behaviour of reef-associated sharks by using acoustic telemetry to help understand their movement ecology at different spatio-temporal scales. A network of 34 acoustic receivers (VR2W, InnovaSea) was deployed on the reefs around Saba, St Eustatius, St Maarten and on the Saba Bank in the northeast Caribbean. Small marine parks are present around Saba, St Eustatius and St Maarten. The large "Yarari" marine mammal and shark sanctuary encompasses the reefs around Saba Bank, Saba, St Eustatius and the pelagic waters in between these reefs. Since 2015, in total 100 sharks were implanted with acoustic transmitters (V16 and V16p, InnovaSea): 53 Caribbean Reef Shark *Carcharhinus perezi*, 15 Silky Shark *Carcharhinus falciformis*, 18 Nurse Shark *Ginglymostoma cirratum* and 14 Tiger Shark *Galeocerdo cuvier*. Juvenile and adult Caribbean reef sharks, juvenile silky sharks and juvenile nurse sharks showed strong residency to relatively small home ranges (a few km) on all four reef systems studied. Individual sharks stayed within the borders of the marine parks for long periods. Adult nurse sharks and juvenile tiger sharks showed higher mobility and shorter lasting residency. Larger scale movements between reefs that were separated by deep pelagic waters (>500m depth) were observed in adult Caribbean Reef sharks, often short lasting directed back and forth movements, juvenile silky sharks, adult nurse sharks and juvenile tiger sharks. Implications of the results for management will be discussed.

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