MAUBYDICK project:
Movements and behaviour of satellite tagged sperm whales in the Indian Ocean

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One of the largest gaps in our understanding of sperm whales is their long-range movements, in particular movements of males which drive gene flows between populations. In the Indian Ocean Whale Sanctuary, information about sperm whales is scarce although critical to protect this species. The Maubydick project primarily aims at gathering data on movements of sperm whales using the waters of Mauritius Island. Six whales were equipped with satellite transmitters in the first year of the project. Data revealed unexpected inter-island movements and an important area used by both males and females southwest of Mauritius. Surprisingly, at that time of the year, females seemed to travel more than males. The next step of our project is to gather longer tracks coupled with diving data for these animals.

Background & Aim

- ✓ Long-range movements of male and female sperm whales (*Physeter macrocephalus*) and diving behaviour during their journey are poorly documented (Whitehead 2003, Whitehead et al. 2008).
- ✓ Such data are however critical to understand the role and behaviour of this top predator in marine ecosystems and to contribute to its conservation.
- ✓ Very little information exists for the sperm whale population occupying the waters of Mauritius Island.
- ✓ Both males and females with calves have been observed but nothing is known of their movements, distribution and habitat range.
- ✓ This study aims at describing for the first time the movements of the sperm whales observed in Mauritius using satellite telemetry.

Methods

- ✓ In December 2014, 2 male and 3 female sperm whales were equipped with Argos satellite transmitters, model SPOT5 (Fig 1) in the waters of Mauritius Island (Fig 2), southwest Indian Ocean.
- ✓ An additional female was tagged with an Argos SPLASH tag which also collected data on her diving behaviour. (Fig. 3)
- ✓ Skin biopsies were collected using a crossbow (Fig.1).

Fig 1: deployment of a satellite tag on a sperm whale using an air gun. A skin biopsy was simultaneously taken using a crossbow.

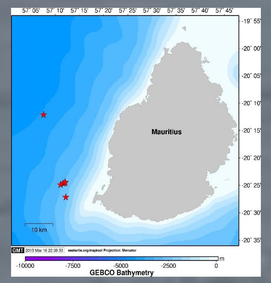


Fig 2: maps showing the locations where tags were deployed

Fig 3: Female sperm whale equipped with a satellite tag

Results & Discussion

Inter-island movements

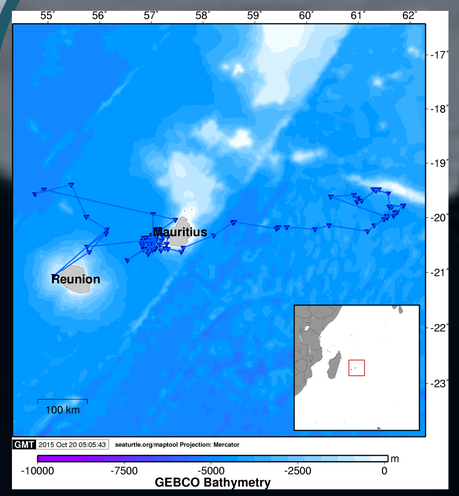


Fig. 4: Inter-island movements of a satellite-tracked female sperm whale equipped in the waters of Mauritius Island on 1 December 2014. The whale travelled 2672 km in 35 days.

- ✓ Difference in behaviour between males and females
- ✓ Males remained in Mauritian waters for the entire tracking period.
- ✓ At least one female left Mauritian waters to visit the nearby islands (Reunion and Rodrigues, Fig. 4).

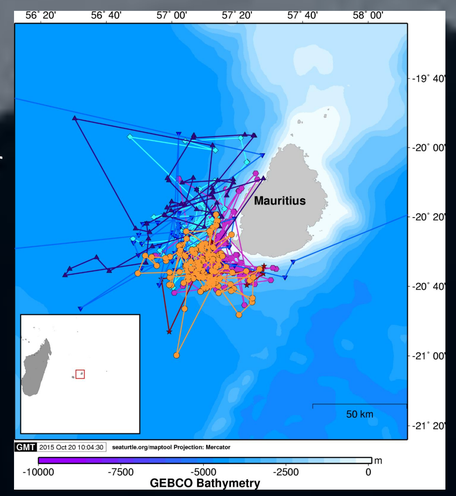
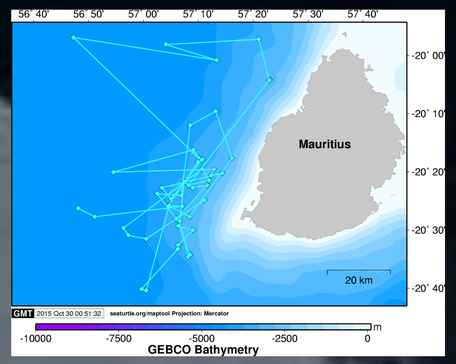


Fig. 5: Movements of satellite-tracked female (blue, light blue, purple and red tracks) and male (orange and pink tracks) sperm whales in Mauritian waters.

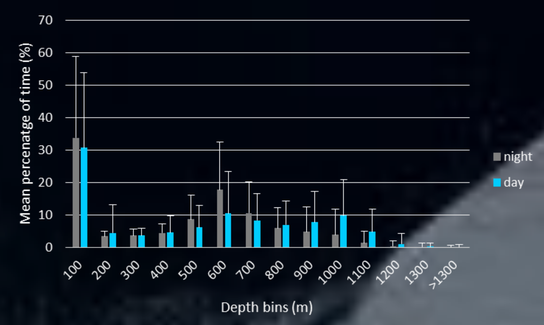
An high-use area south-west of Mauritius

- ✓ An important area has been identified, southwest of Mauritius, ~30km offshore (Fig. 5).
- ✓ All satellite-tracked males and females used this area
- ✓ This may be an important area for breeding and/or feeding.
- ✓ Travel rates varied between 38 and 50km/day.
- ✓ Tracking durations varied between 20 and 48 days.

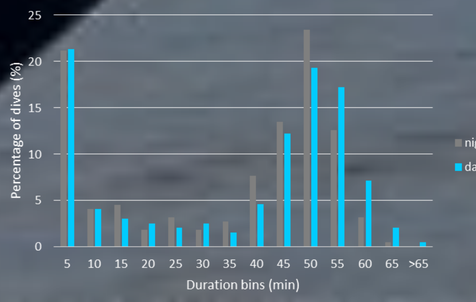


- ✓ The female sperm whale equipped with a SPLASH tag stayed west of Mauritius, 10-40 km offshore, during the 37 days she was tracked and travelled 1422 km.

Diving behaviour



- ✓ Dives lasting >1 hour and deeper than 1300 m were recorded for this female.
- ✓ The whale spent on average 32.4 ± 24.5 % of its time between [0-100m[(i.e. 33.7% of dives) and just over 4% at depths > 1000 m (i.e. 23.9% of dives).
- ✓ Frequency distributions of time at depth and number of dives were different between day and night with deeper dives during the day.



- ✓ The duration of 467 dives was recorded. 21.8% of the dives lasted between [0-5min[and 21.2 % of the dives lasted between]50-55min[.
- ✓ 6% of the dives lasted over an hour (n = 467 dives).
- ✓ No major difference was observed between day and night.

References: Whitehead(2003) Sperm whales' social evolution in the ocean. University of Chicago Press, Chicago, IL. Whitehead et al. (2008) Movements of sperm whales in the tropical Pacific. Mar Ecol Prog Ser 361: 291–300

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