

# The ontogeny of southern elephant seal foraging migration strategies: finding their way as they go

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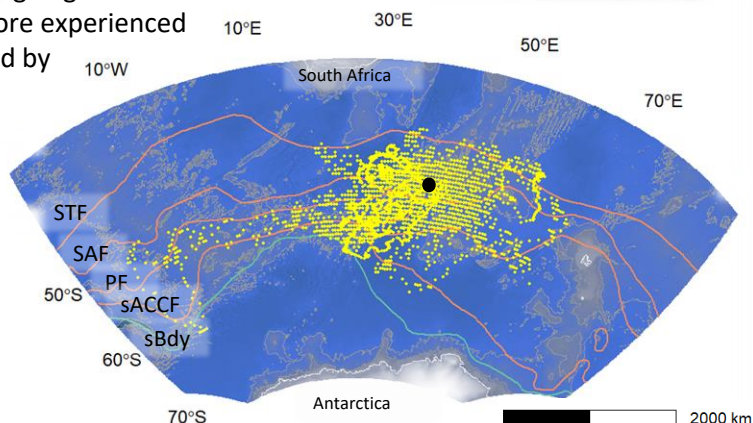
## Background

- Naïve, recently weaned southern elephant seal pups depart unaccompanied on distant foraging migrations from their natal islands.
- The role of navigational abilities, environmental cues and individual learning is poorly understood.
- We instrumented 21 recently weaned southern elephant seals at Marion Island with geolocation tags and compared foraging migrations undertaken during their first year of life with migrations of more experienced elephant seals (200 foraging migrations completed by 123 instrumented seals).

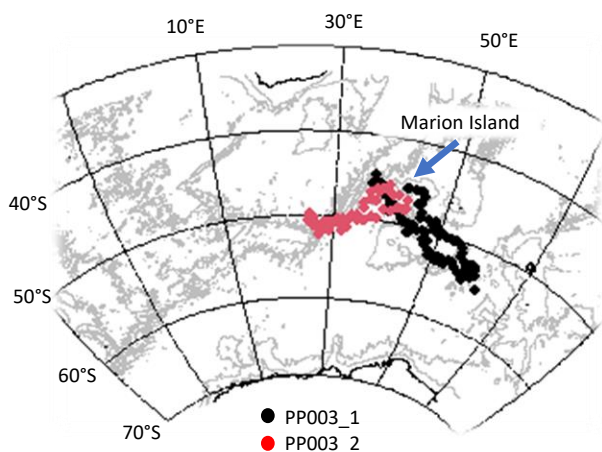
## Results

- Weaned pups broadly used inter-frontal areas to the south-west of Marion Island (Fig. 1).
- Individual weaned pups showed substantial variation between foraging areas utilized over multiple migrations performed during their first year (e.g. Fig. 2).
- Adult females and subadults (both sexes) from this population display directed, relatively straight outbound south-westward movements away from Marion Island. In contrast, recently weaned pups foraged in multiple directions (Fig. 3).

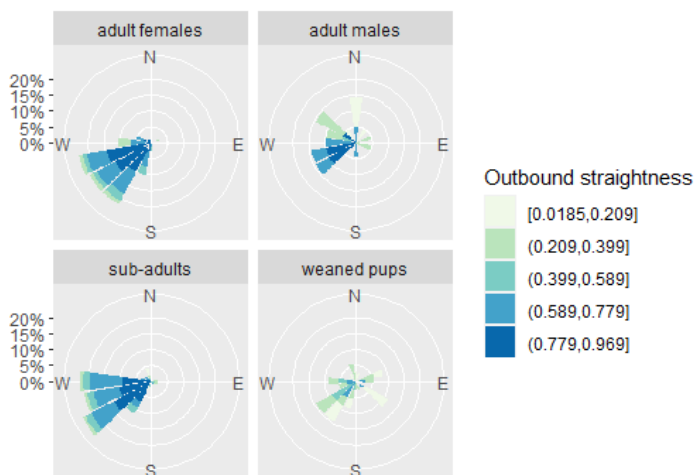
...how?



**Fig. 1.** At-sea foraging locations of recently weaned elephant seal pups from Marion Island. Front locations are indicated as per Chapman et al. (2020). ● Marion Island.



**Fig. 2.** First and second migrations of one seal (PP003). Trip 1 (PP003\_1) aged ~ 48 days; Trip 2 (PP003\_2) aged ~ 71 days.



**Fig. 3.** Recently weaned elephant seals showed little common directionality in foraging ranges and more convoluted outbound movements from Marion Island; straightness index: 1 = straight line; 0 = random movement.

## Conclusion

Foraging strategies of elephant seals are likely strongly influenced by **individual learning** during the first year of life. Individual consistency of foraging migration strategies develop after the first year of life with most seals displaying high foraging site fidelity as sub-adults and adults (McIntyre et al. 2017). The relative roles of innate navigational abilities and environmental cues in shaping foraging strategies remain largely unknown.

## Acknowledgements

Harry Burton + Marion sealers (1999 – 2016)



## References

Chapman et al. 2020. *Nature Climate Change* <https://doi.org/10.1038/s41558-020-0705-4>  
McIntyre et al. 2017. *Animal Behaviour* <http://dx.doi.org/10.1016/j.anbehav.2017.03.006>