

Movement Ecology of Whale Sharks at Ningaloo Reef

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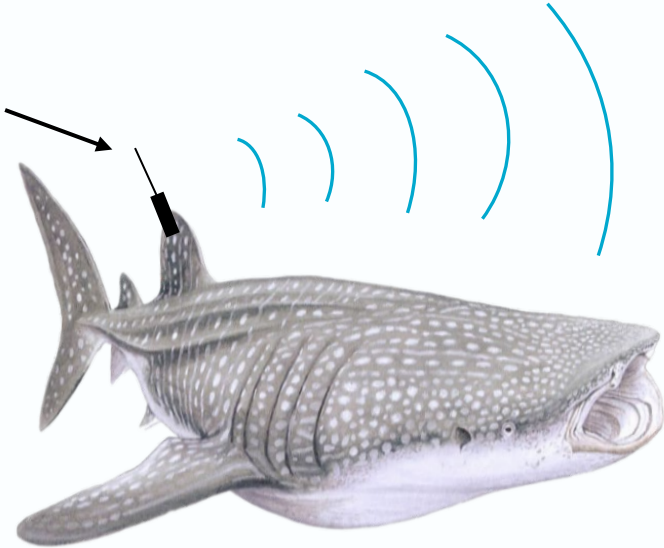
CSIRO Ningaloo Outlook Whale Shark Team:

Toby Patterson, Anthea Donovan, Mat Vanderklift,
Wayne Rochester and Richard Pillans.

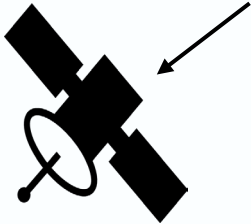


Studying whale shark behaviour in the wild

Satellite transmitter



Satellite



CSIRO Whale Shark Tagging Summary



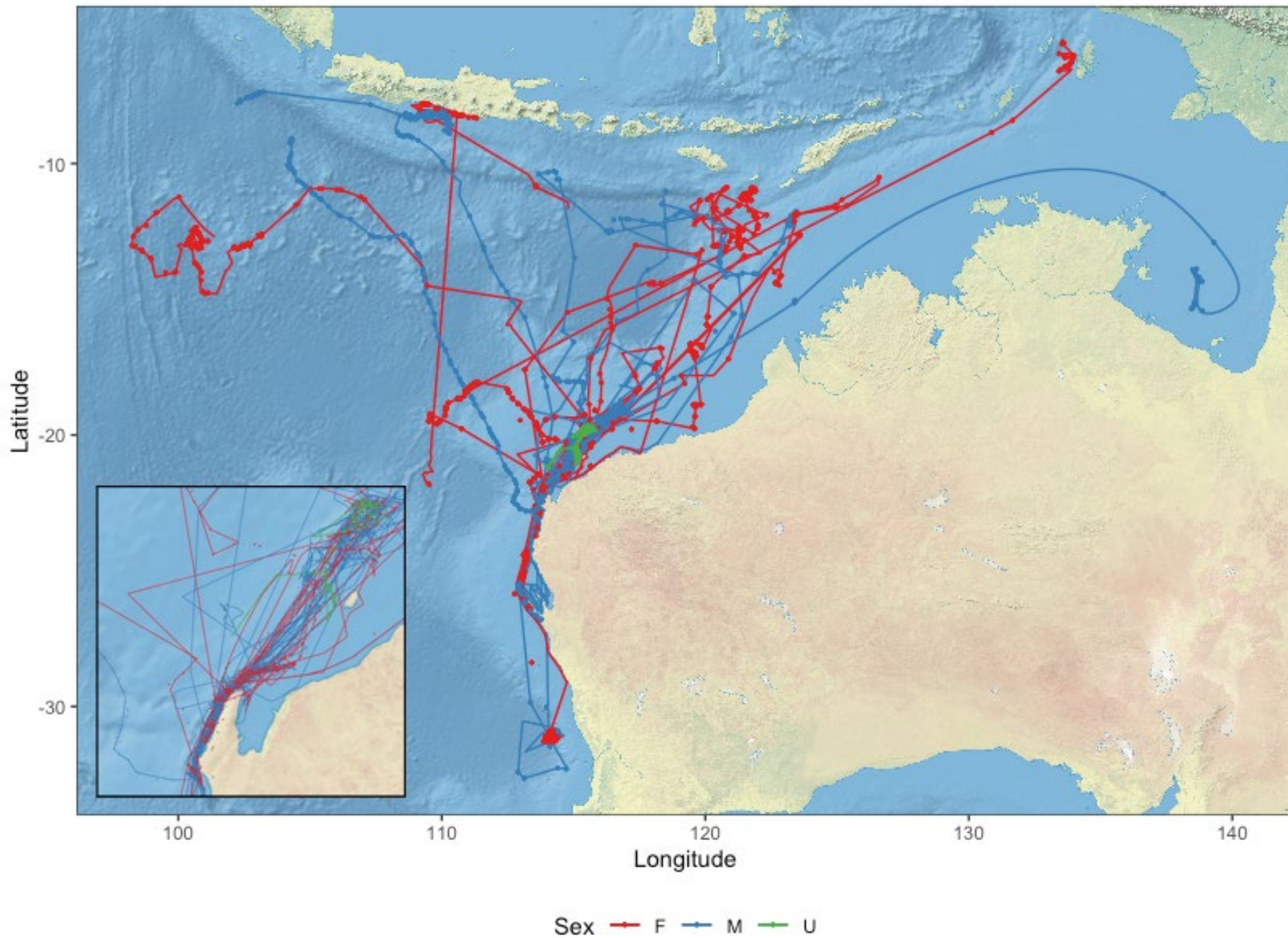
- **39 whale sharks tagged 2015 – 2018**
- **Equal numbers of males and females**
- **Size range 3.8 – 9.5 m total length**
- **Satellite track duration 8 - 340 days, average duration 109 days.**

Aims and Objectives



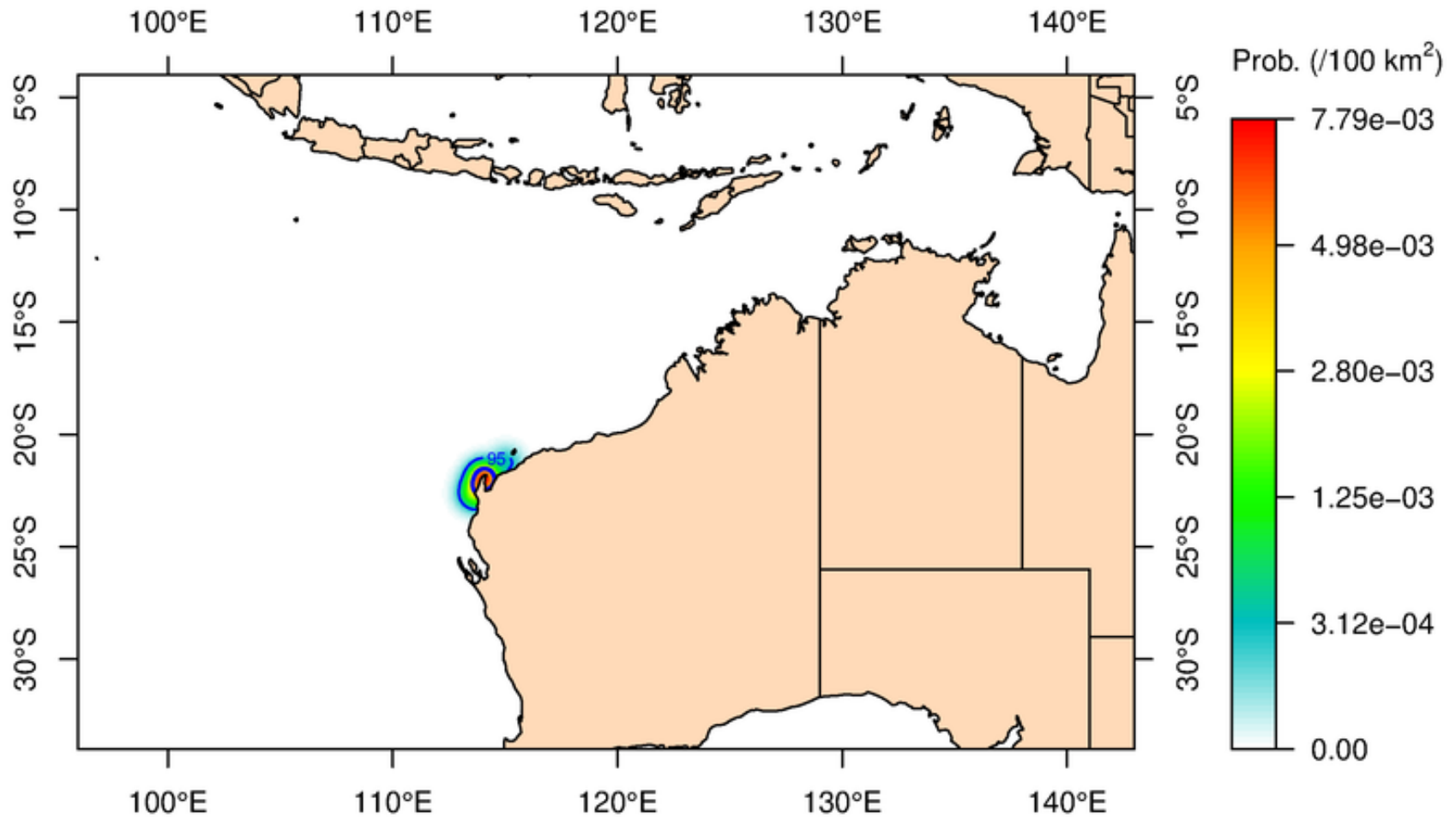
- **Where do whale sharks go once they leave Ningaloo?**
- **What are the diving behaviours of whale sharks, ie. their use of depth and temperature? How does this vary with location?**
- **Are there sex and size specific differences in movement?**
- **What are the seasonal patterns of change in movement?**

Whale Shark Movement

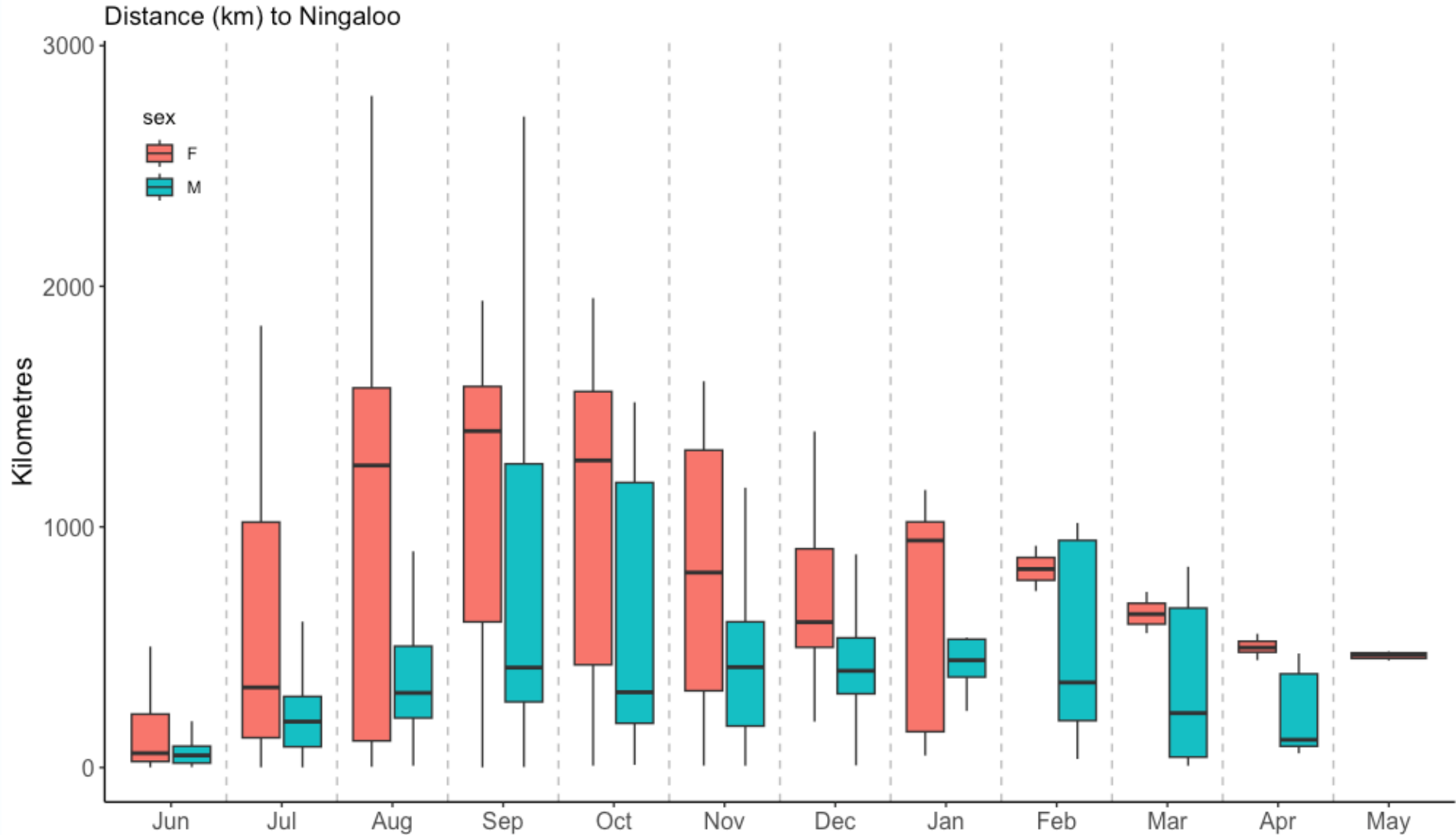


Seasonal movements

May, 3 tags, 104 detections



Monthly distance to Ningaloo for male and female sharks

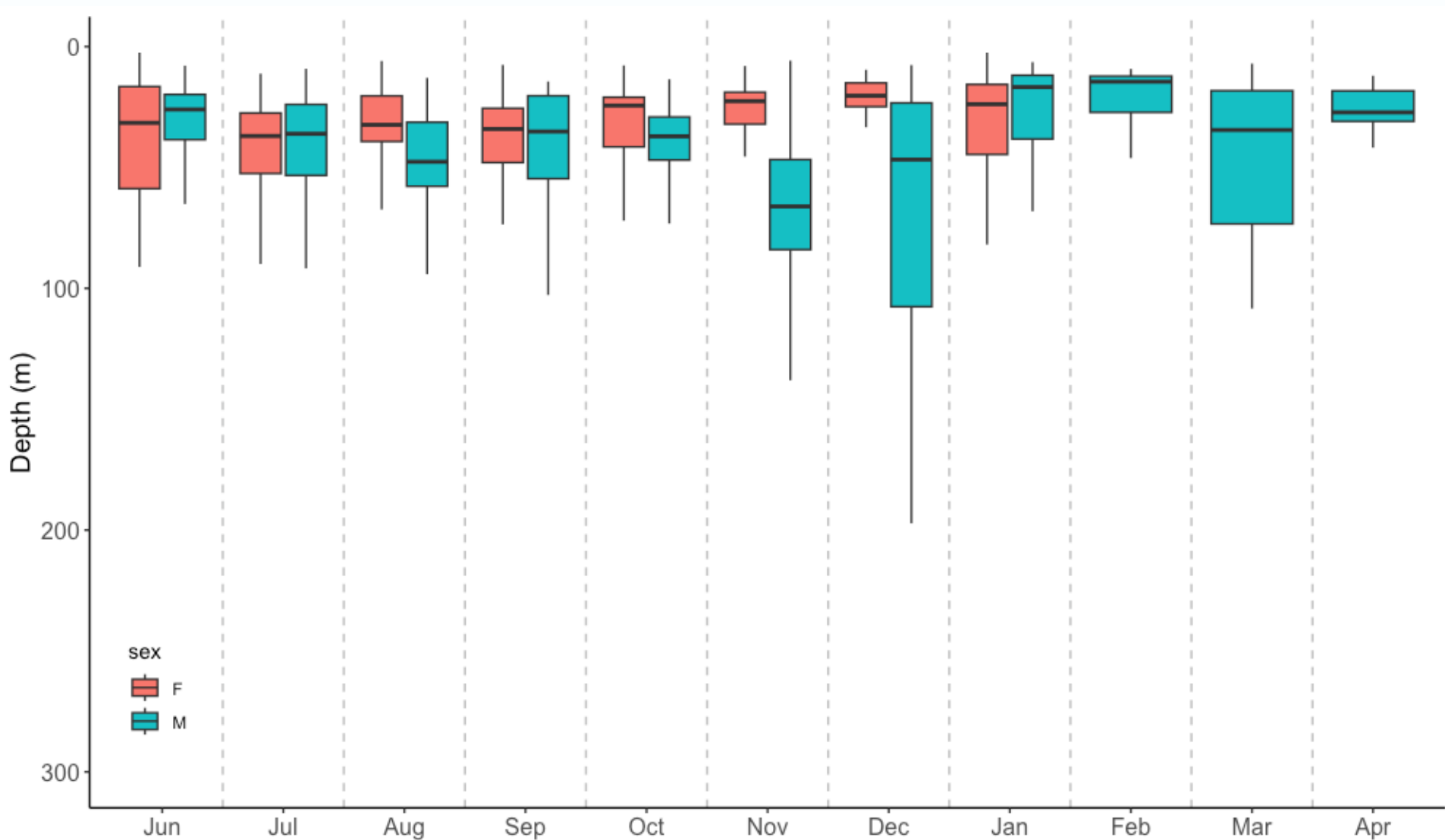


Overall Whale Shark Movement Patterns

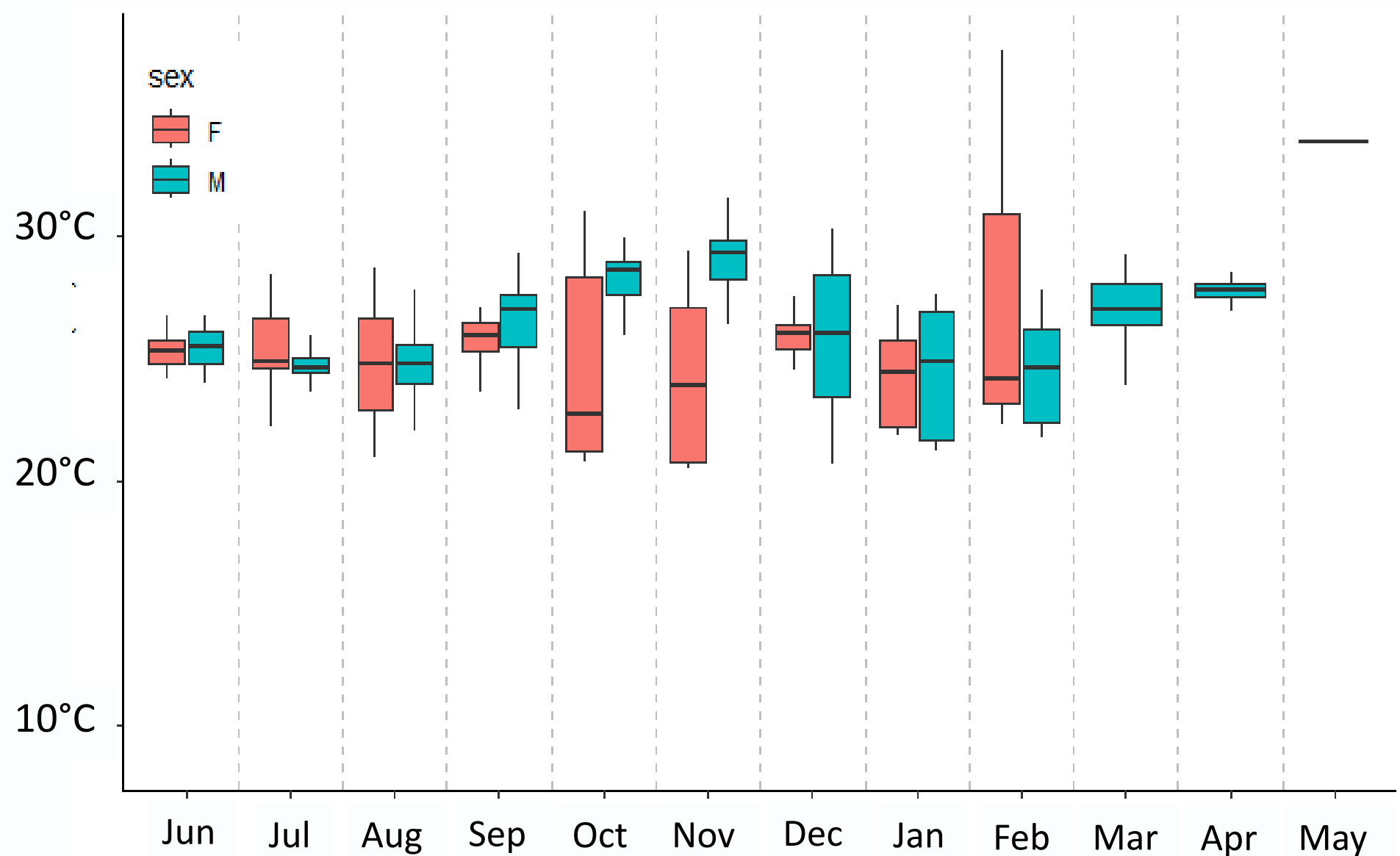
- Some stay and some leave Ningaloo
- Dive much more when not travelling
- 90% of time spent in waters ≤ 200 m
- Occasional dives to >1000 m, with deepest dive up to 1,906 m!
- Temperature range 3 – 36 °C



Monthly average depth for male and female sharks

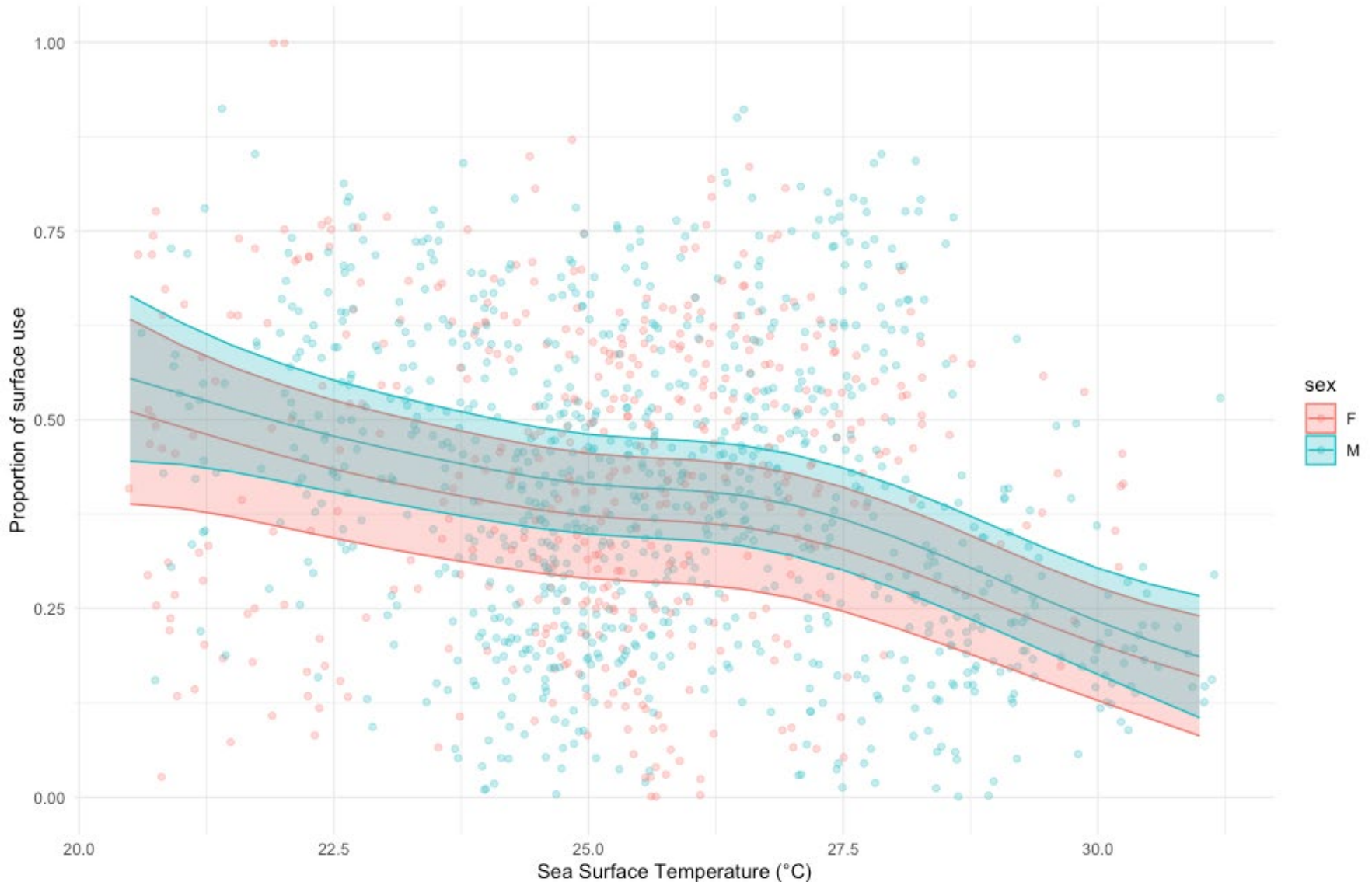


Temperature experienced by male and female sharks



Does SST influence surface use differently for males and females?

Proportion of time (0-100%) spent at the surface (top 10m), relative to SST



What about Large (>7.5 m) and Small (<7.5m) whale sharks?

Proportion of time (0-100%) spent at the surface (top 10m), relative to SST



Next steps

- Investigating seasonal movements in relation to size and sex of WS
- Further modelling of depth use patterns
- Identifying drivers of differences in vertical habitat use between males and females



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Acknowledgements

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- CSIRO Whale Shark Team



Supervisors

- Dr. Richard Pillans, CSIRO
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- Prof. Jayson Semmens, IMAS

