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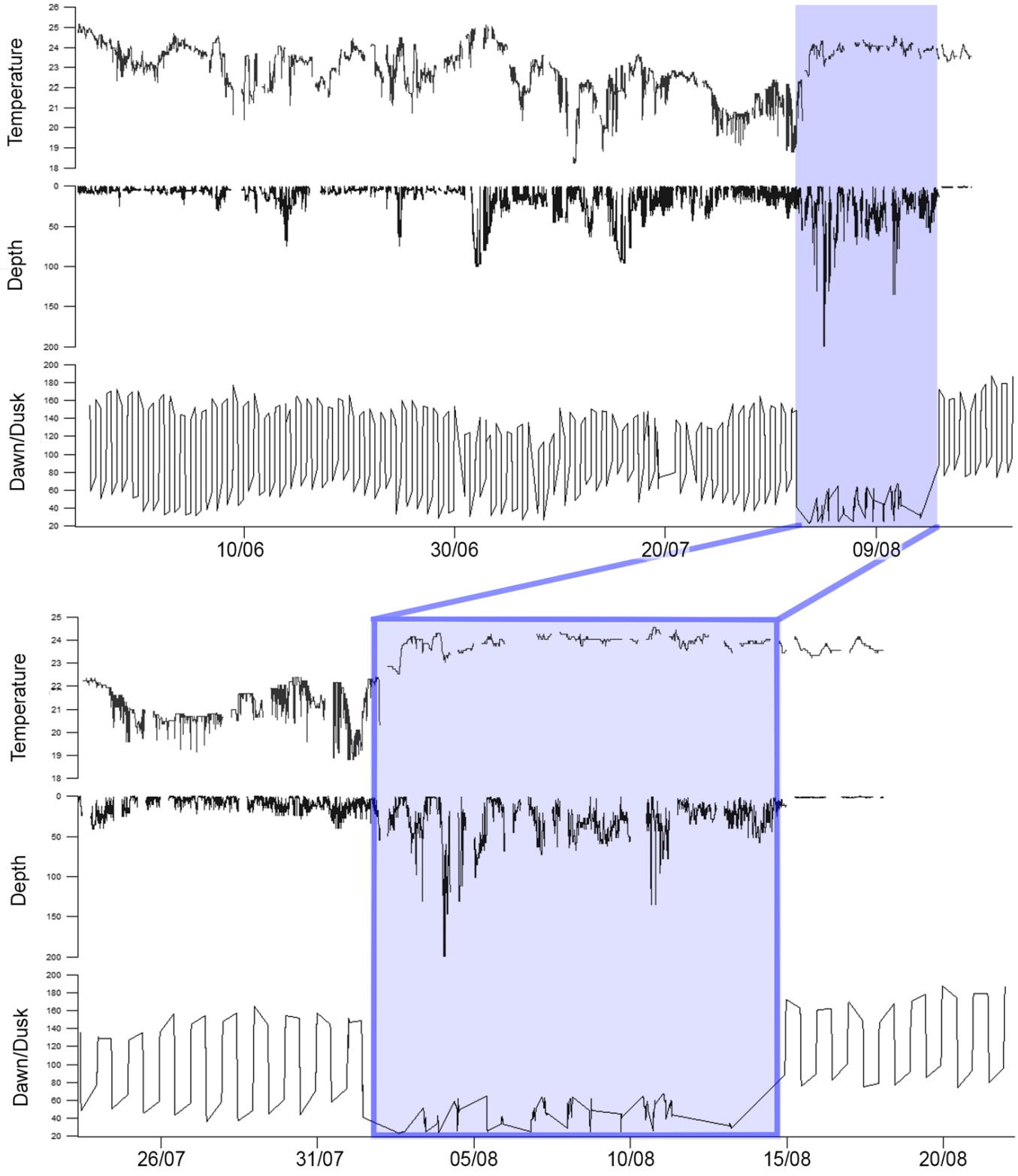

Supplementary Figure 1: Time series observations for Tag 146004 with a period of suspected tag predation highlighted. During the suspected predation event, the light levels drop to constant darkness, deep diving activity appears to increase and the temperature trace appears constant despite depth variation. The beginning of this period of reduced light levels was therefore considered to be the end of tag tracking for light-based geolocation.

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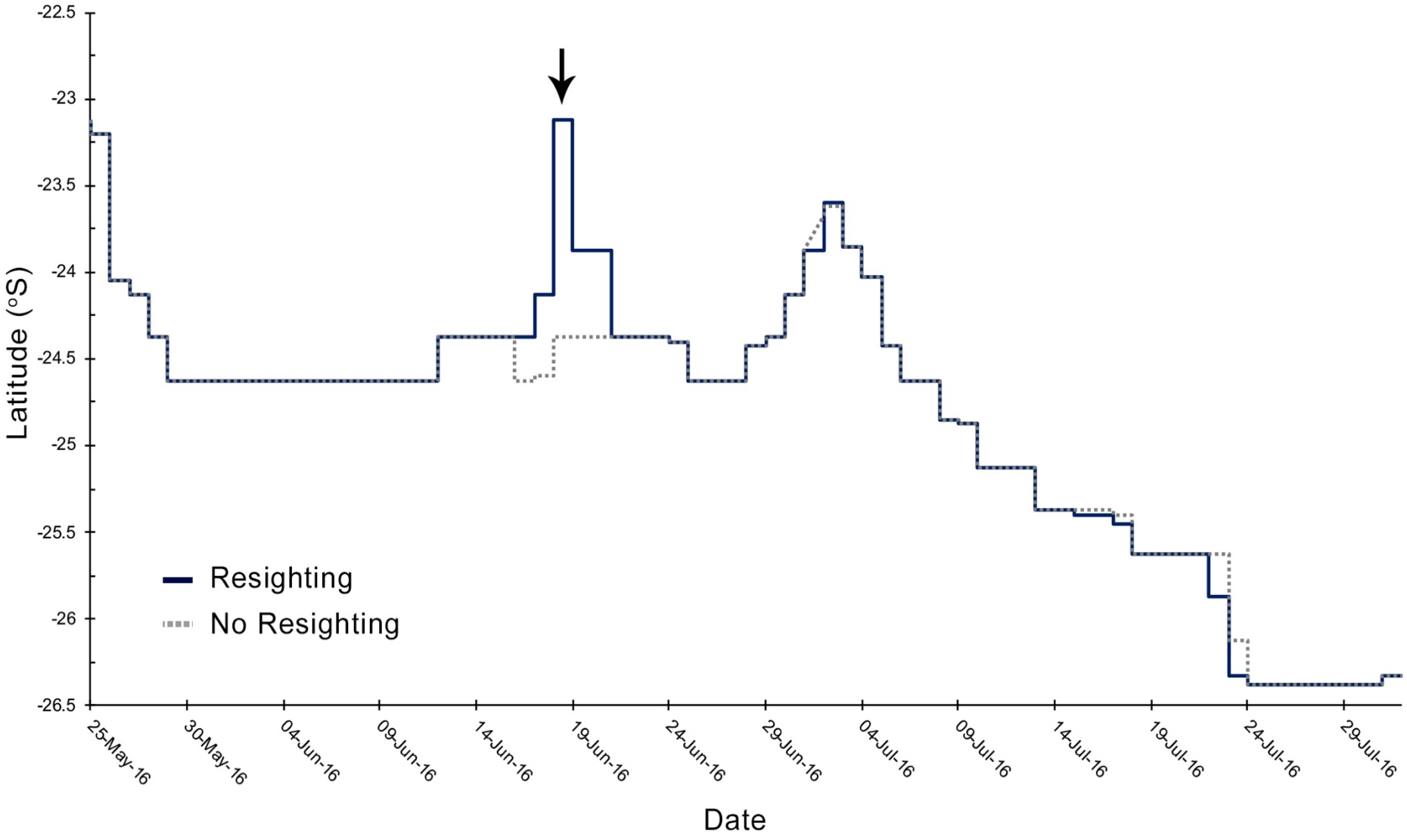

Supplementary Figure 2. Maximum likelihood latitude of the modelled tag track for Tag 146004 (deployed in Coral Bay) with (solid line) and without (dashed line) the incorporation of a photographic re-sighting (arrow).

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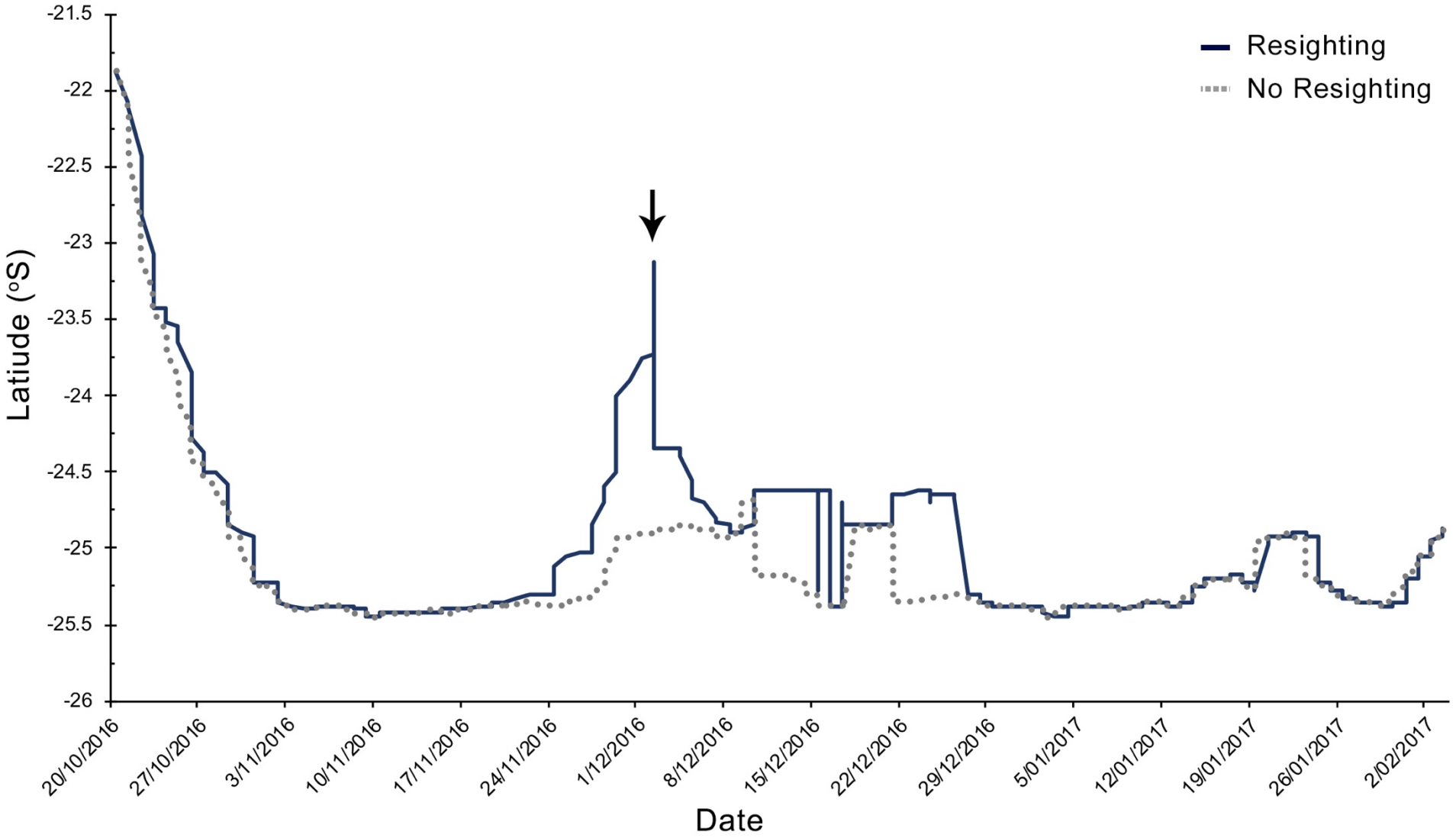

Supplementary Figure 3. Maximum likelihood latitude of the modelled tag track for Tag 165340 (deployed in the Exmouth Gulf) with (solid line) and without (dashed line) the incorporation of a photographic re-sighting (arrow).

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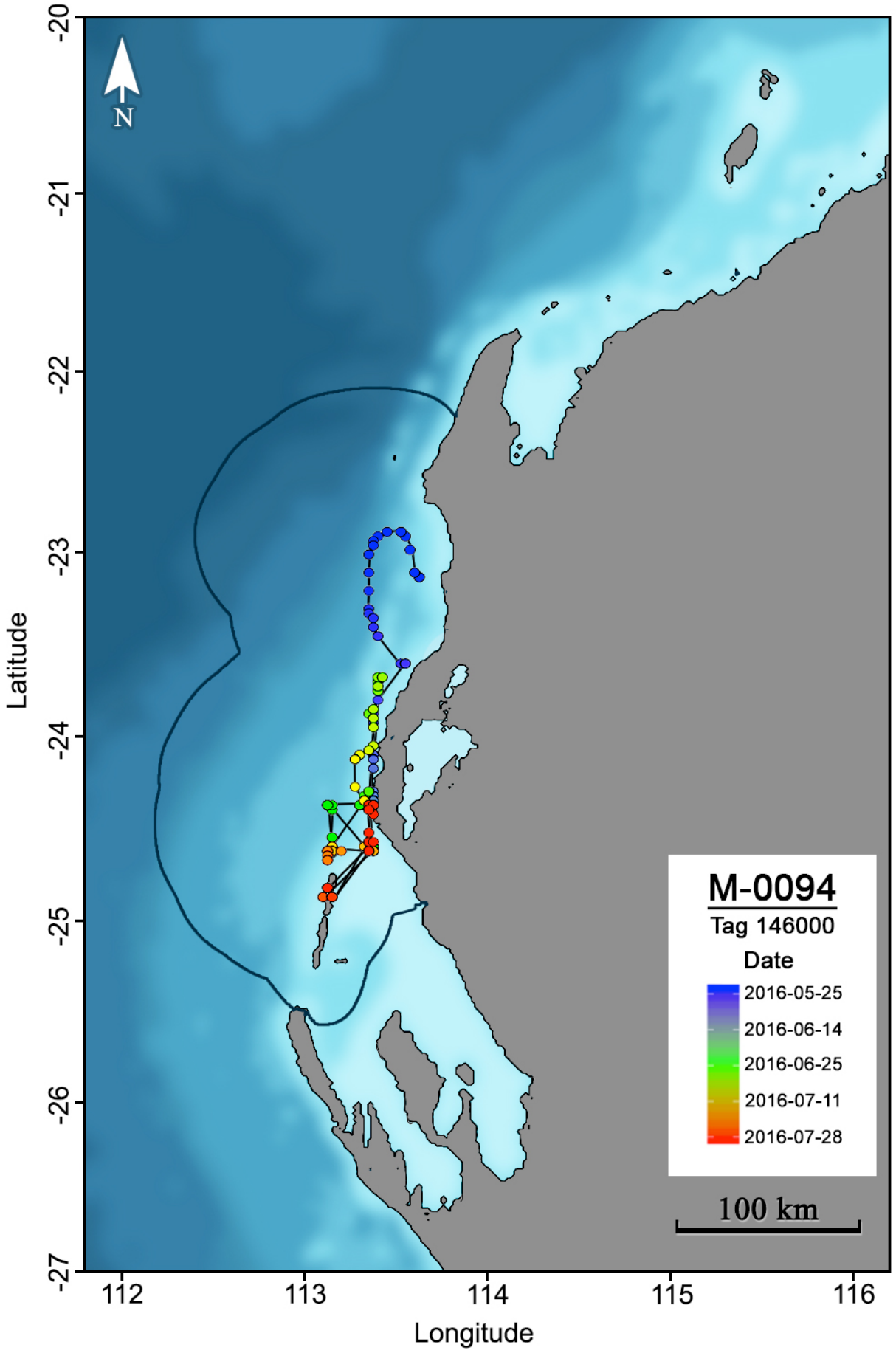

Supplementary Figure 4. Maximum likelihood track MiniPAT tag 146000 deployed on manta #0094. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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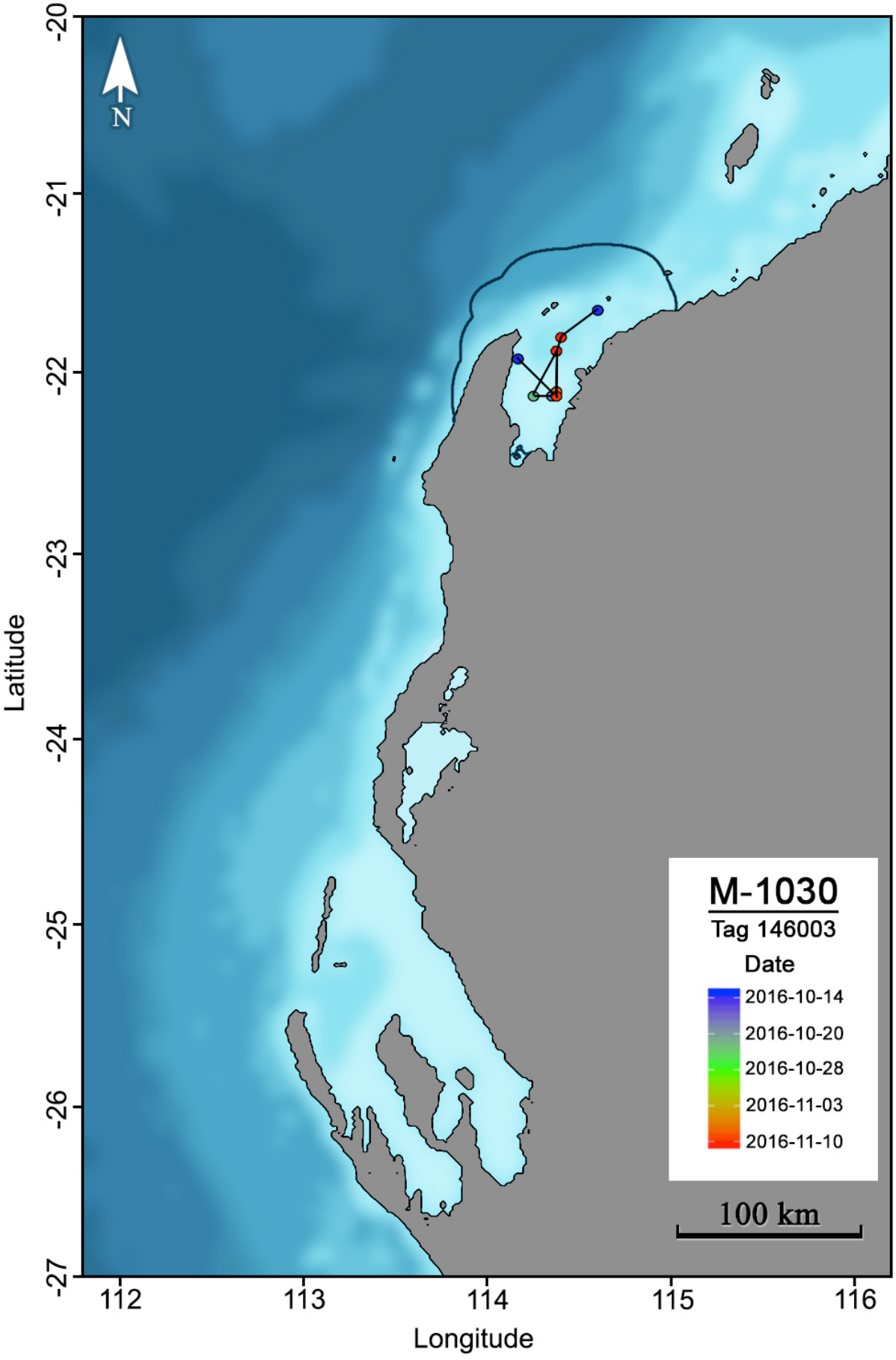

Supplementary Figure 5. Maximum likelihood track MiniPAT tag 146003 deployed on manta #1030. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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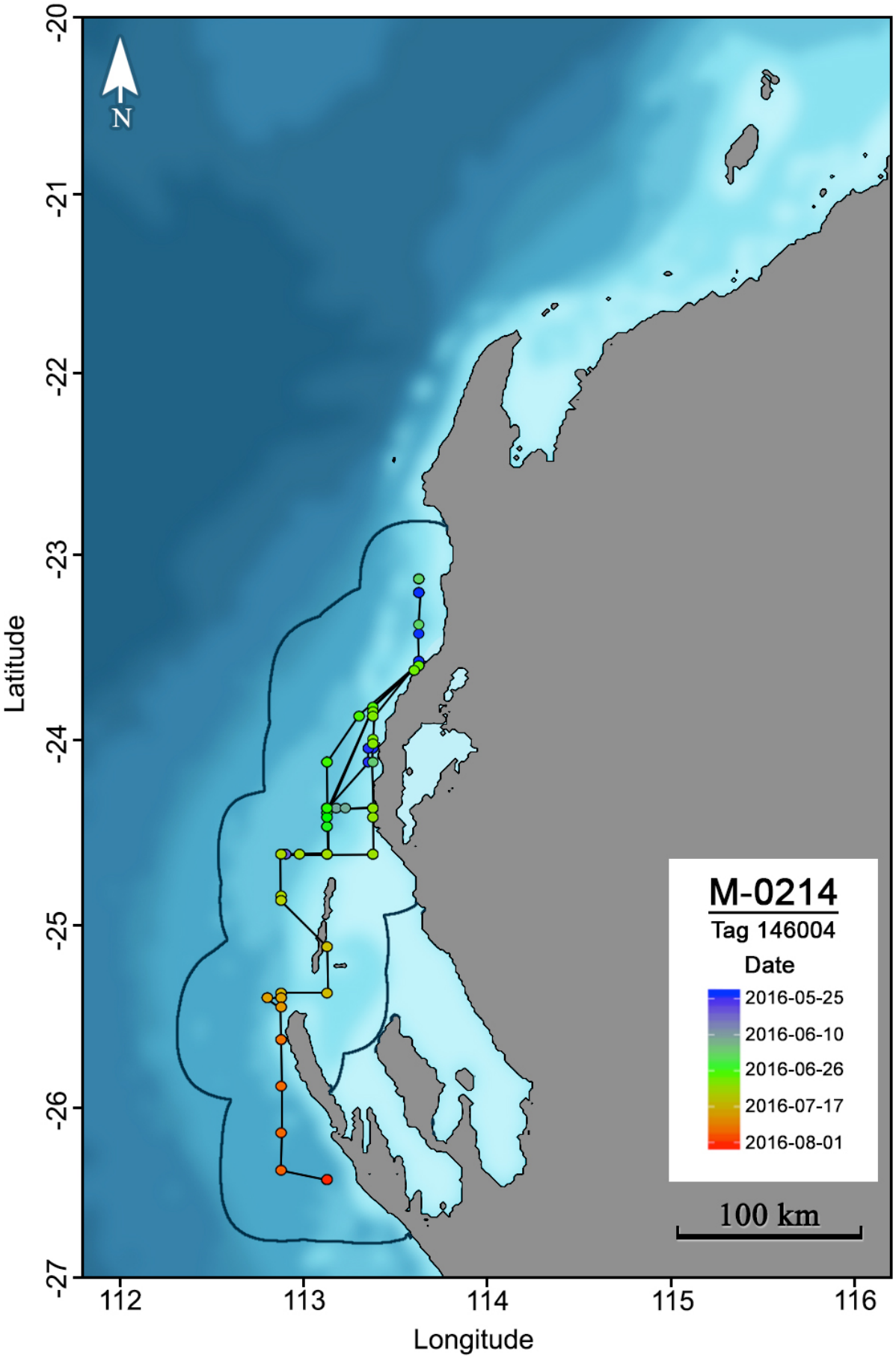

Supplementary Figure 6. Maximum likelihood track MiniPAT tag 146004 deployed on manta #0214. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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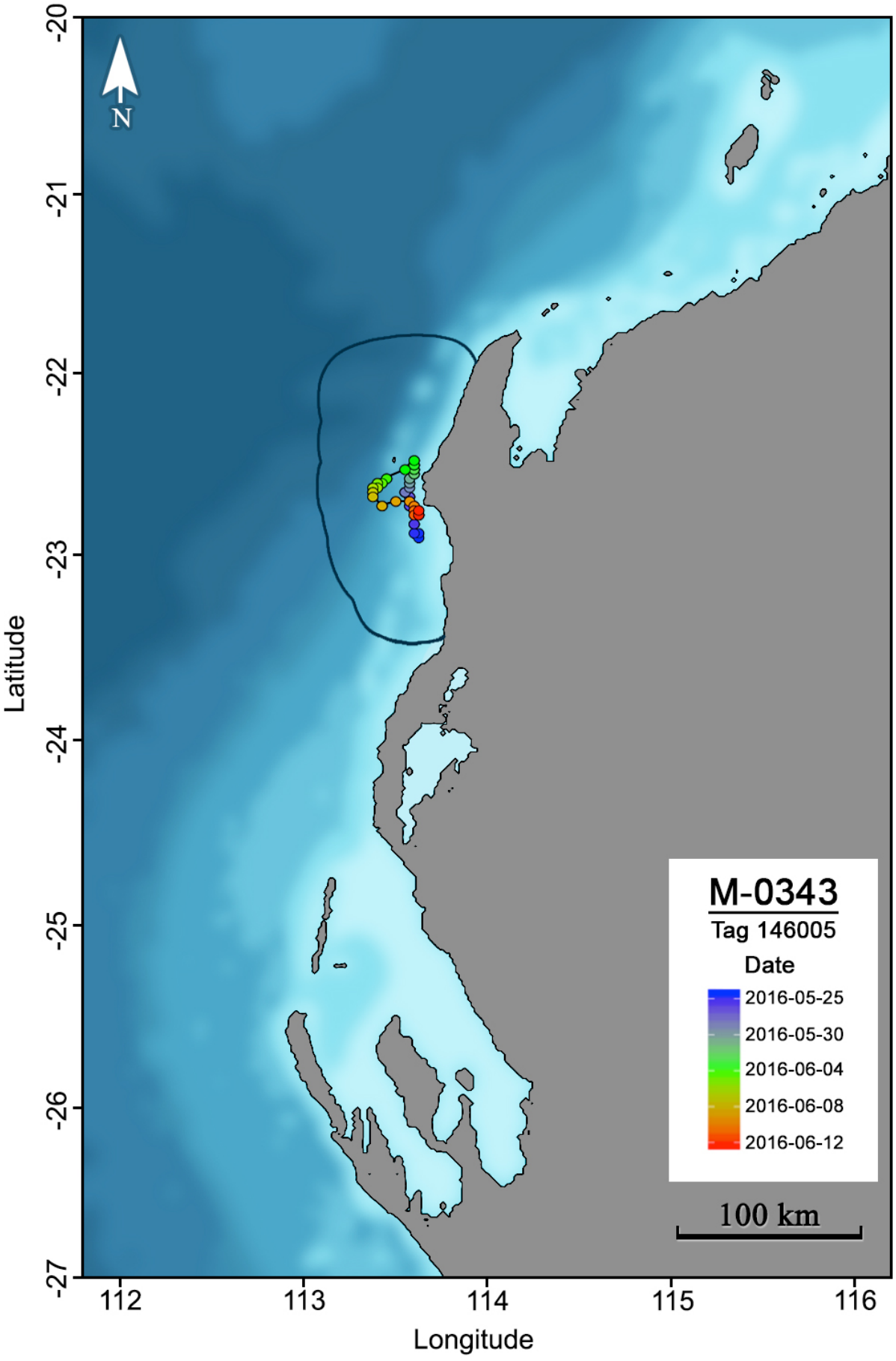

Supplementary Figure 7. Maximum likelihood track MiniPAT tag 146005 deployed on manta #0343. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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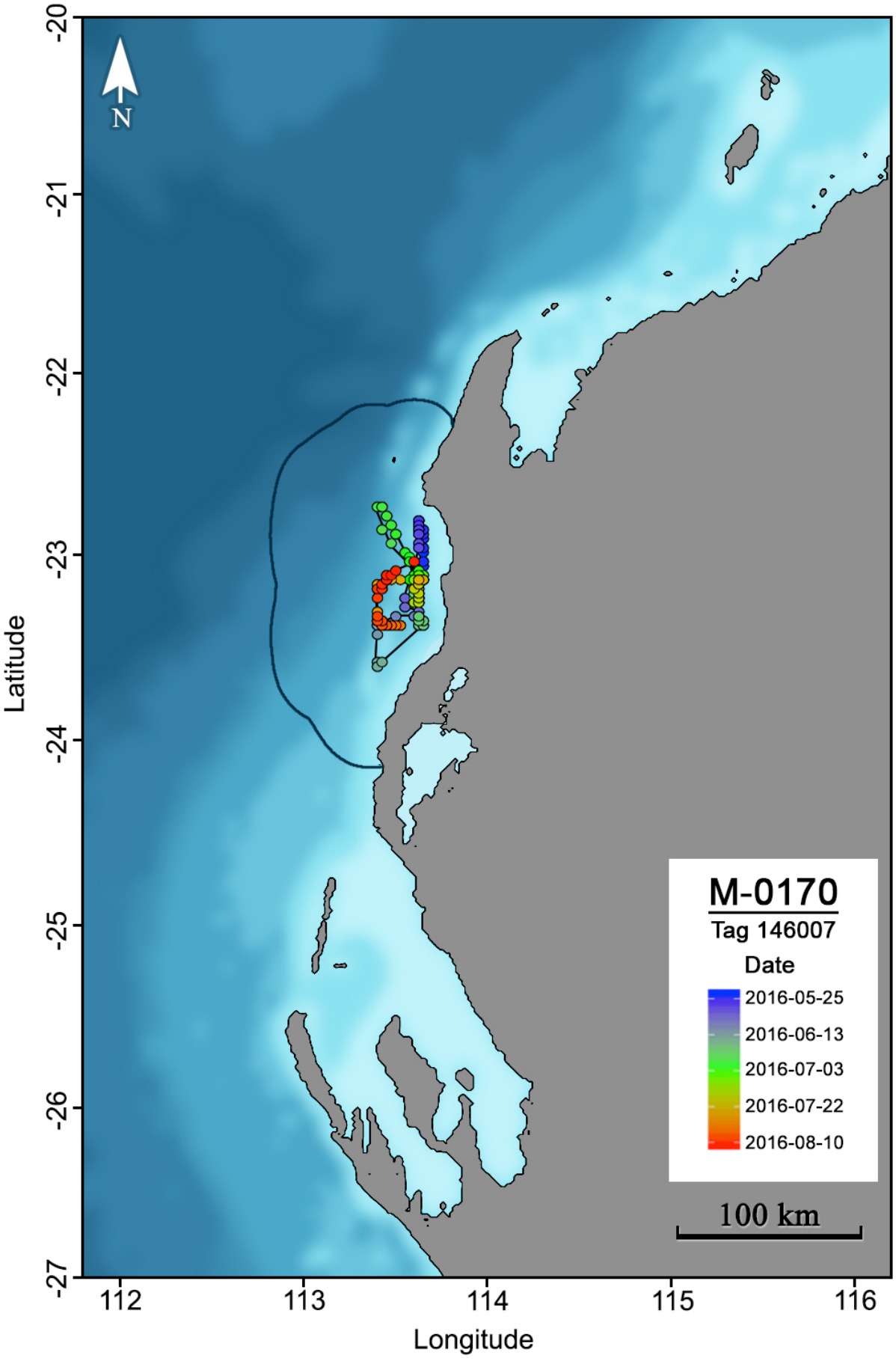

Supplementary Figure 8. Maximum likelihood track MiniPAT tag 146007 deployed on manta #0170. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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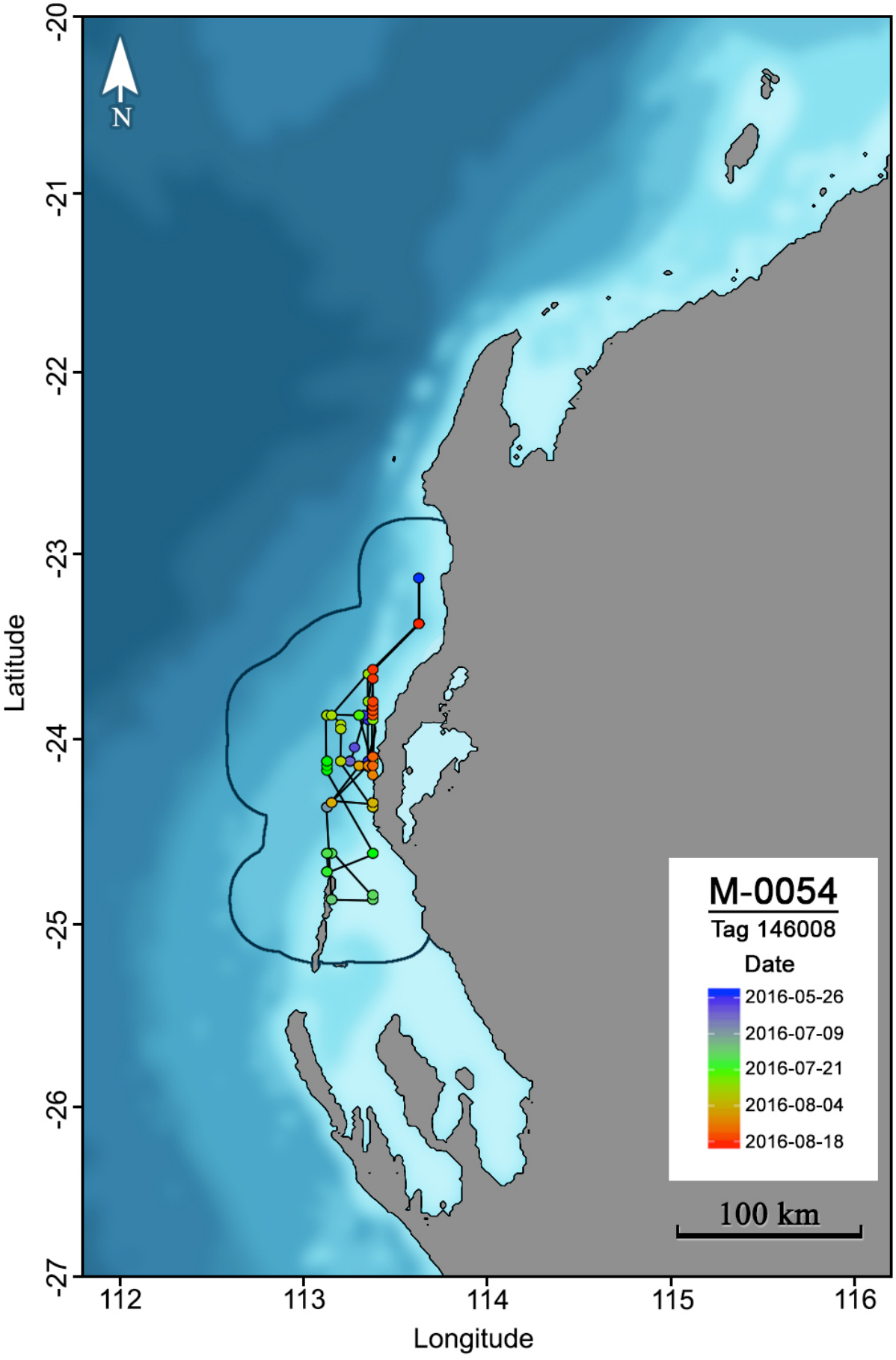
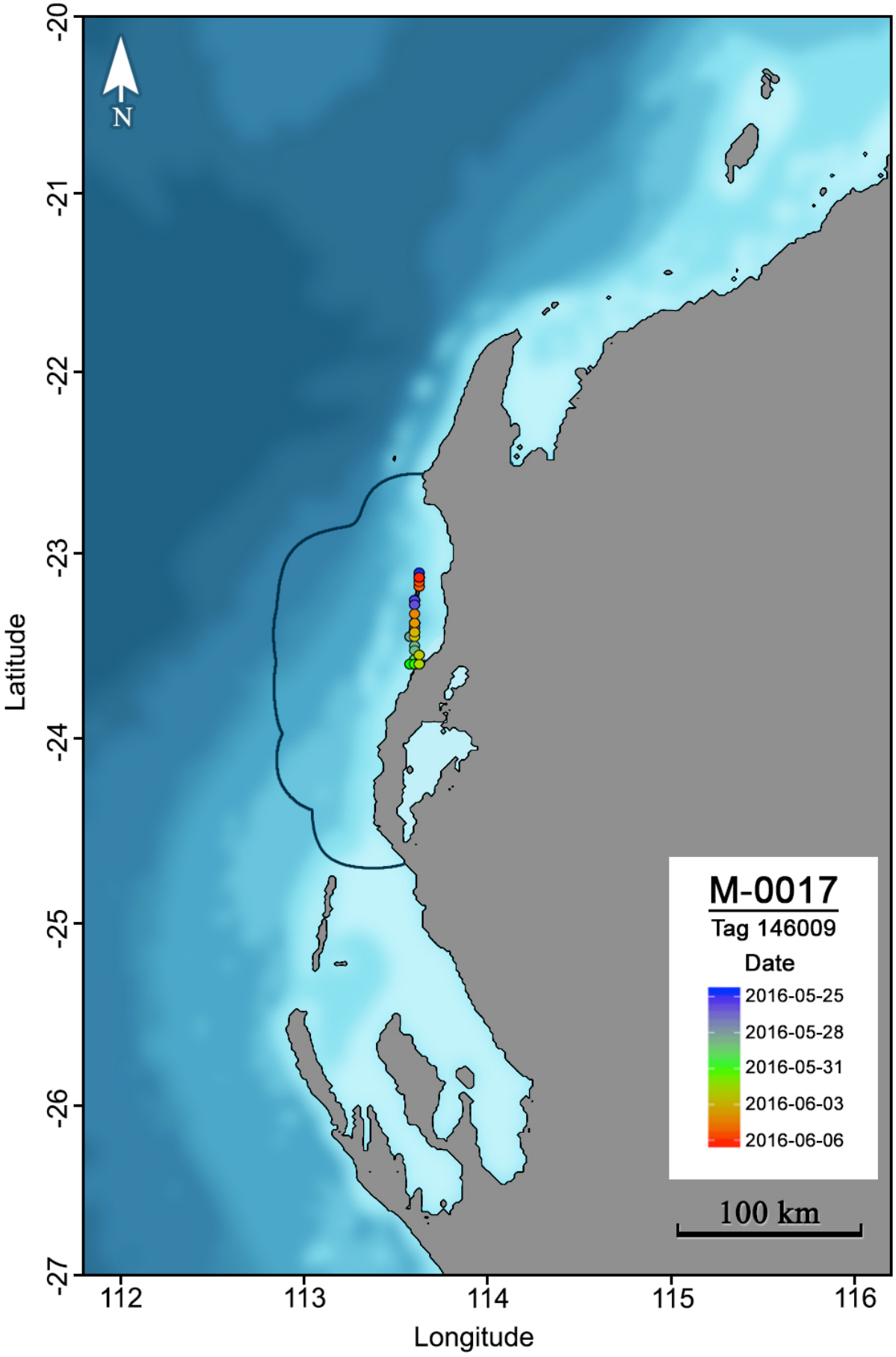
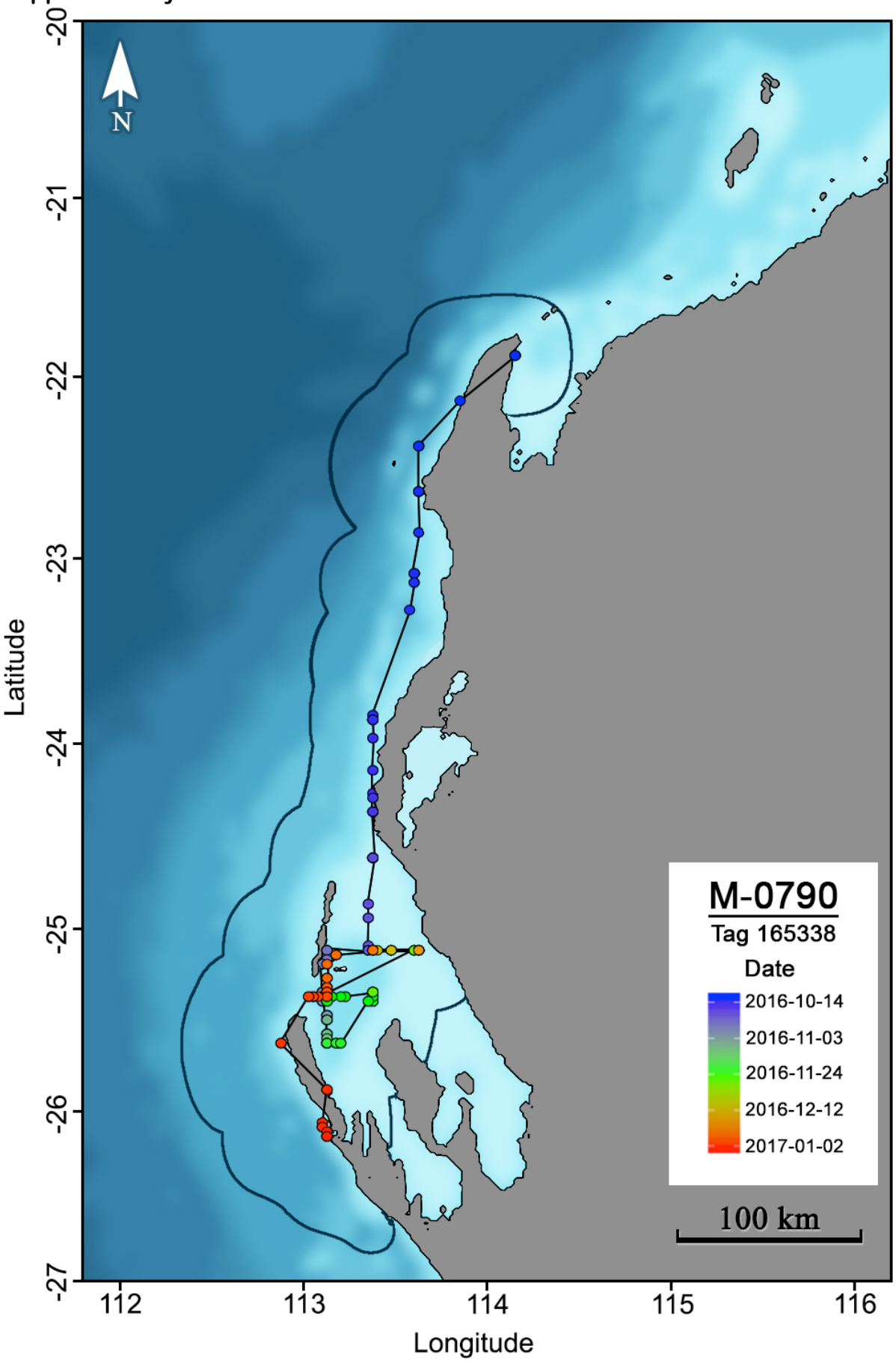


Supplementary Figure 9. Maximum likelihood track MiniPAT tag 146008 deployed on manta #0054. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.



Supplementary Figure 10. Maximum likelihood track MiniPAT tag 146009 deployed on manta #0017. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.



Supplementary Figure 11. Maximum likelihood track MiniPAT tag 165338 deployed on manta #0790. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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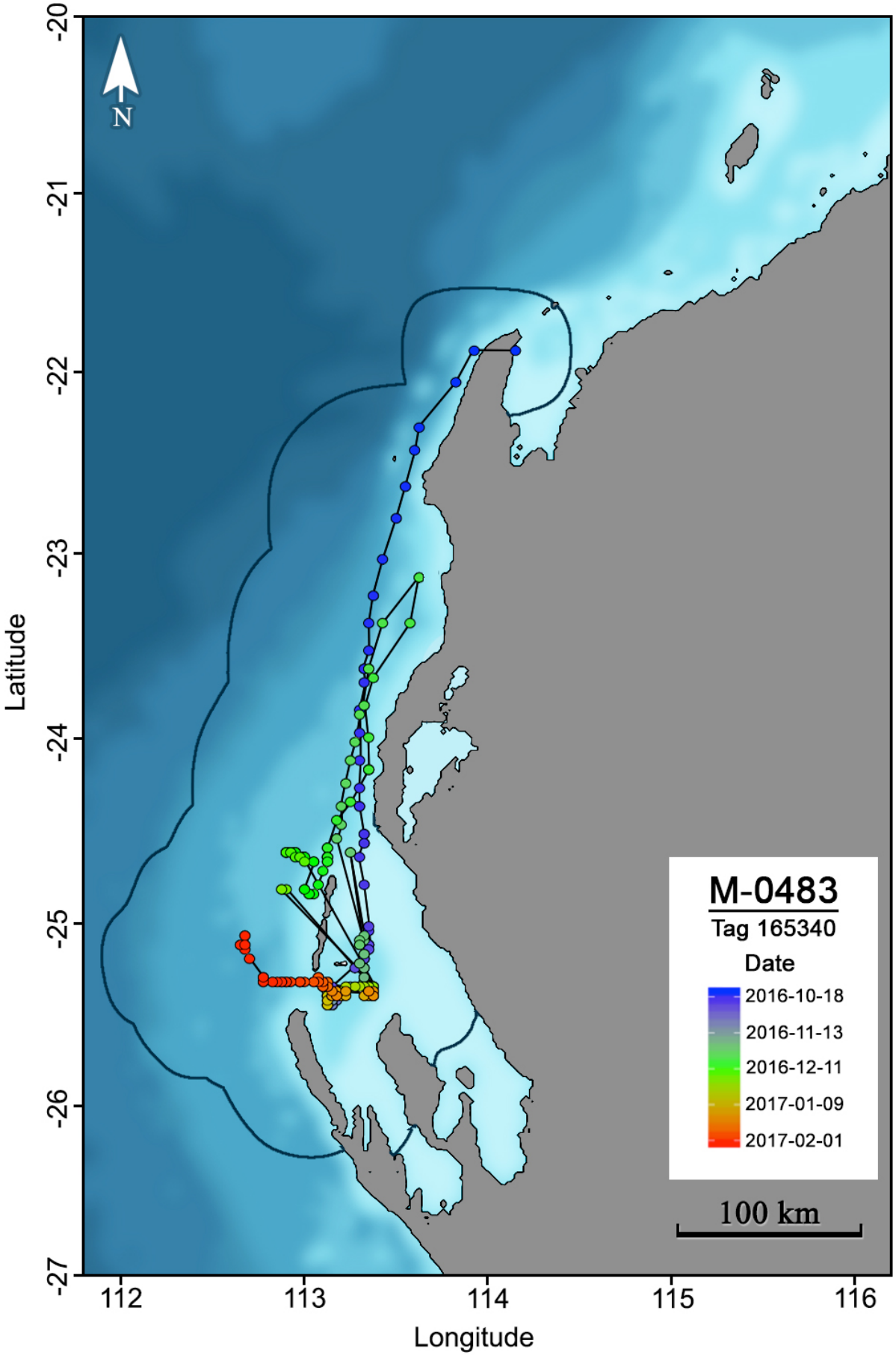

Supplementary Figure 12. Maximum likelihood track MiniPAT tag 165340 deployed on manta #0438. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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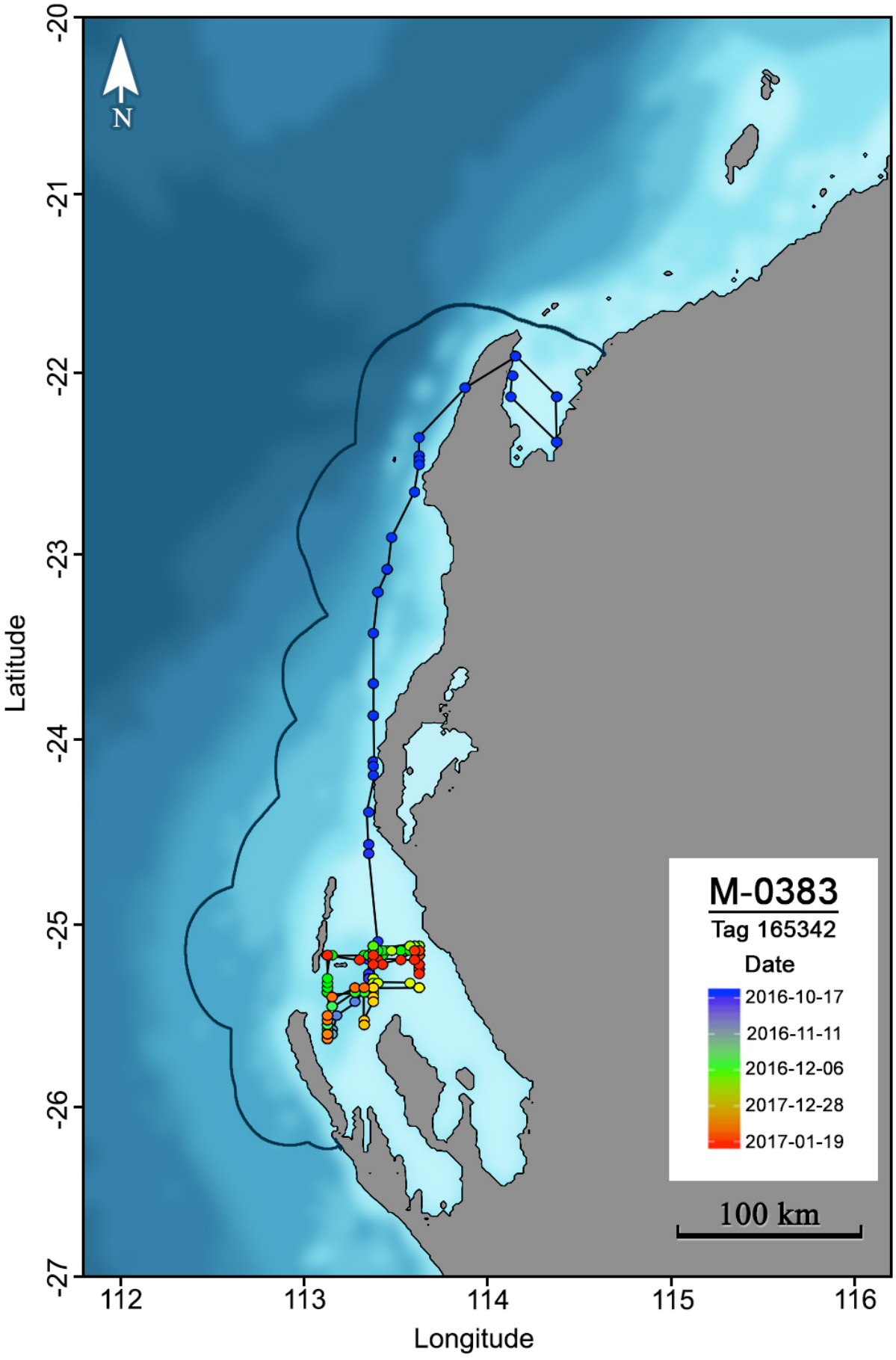
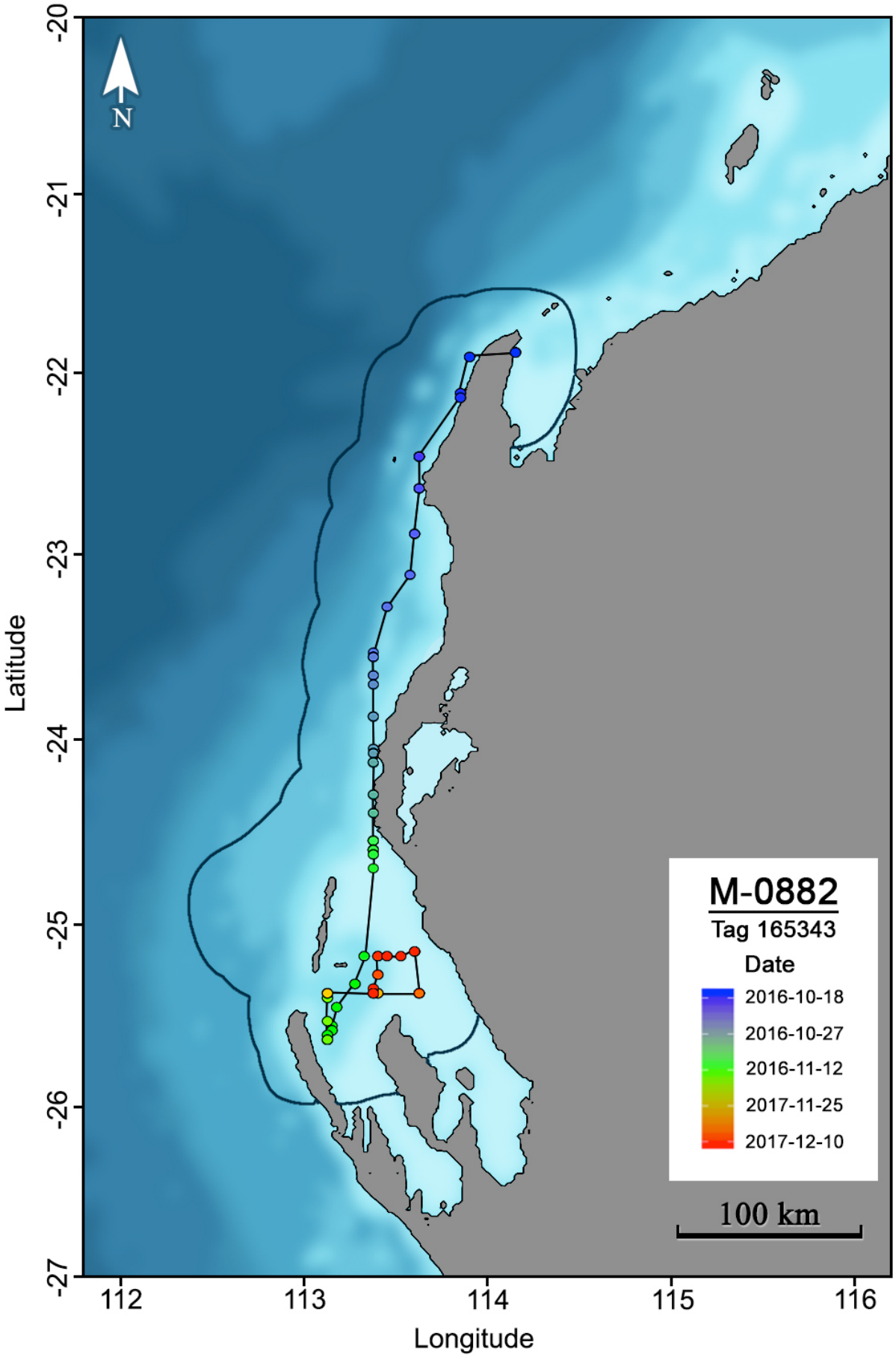
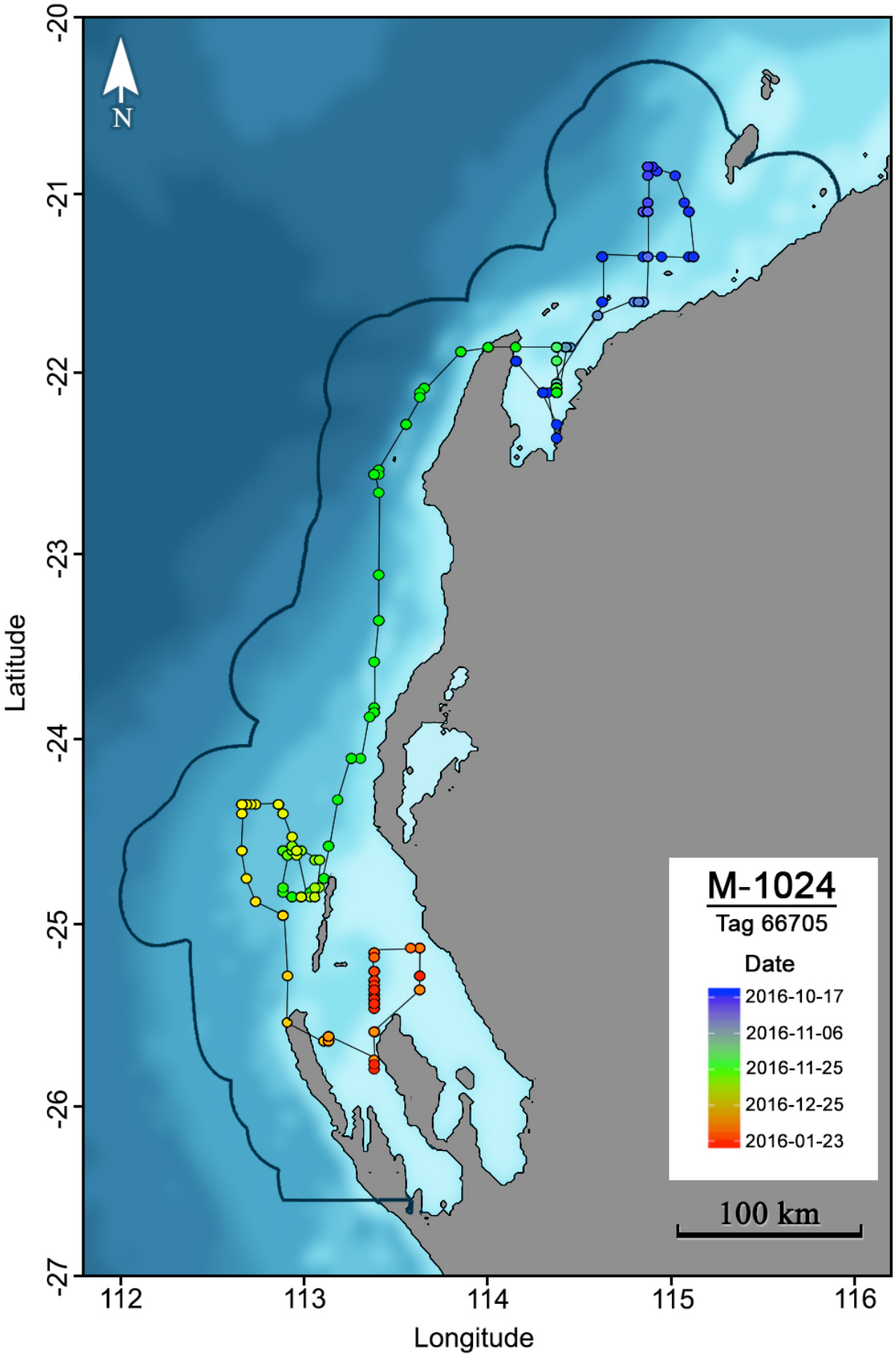


Supplementary Figure 13. Maximum likelihood track MiniPAT tag 165342 deployed on manta #0383. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.



Supplementary Figure 14. Maximum likelihood track MiniPAT tag 165343 deployed on manta #0882. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.



Supplementary Figure 15. Maximum likelihood track MiniPAT tag 66705 deployed on manta #1024. Solid black line abutting the coast represents the outer bound of the 99% maximum likelihood area.

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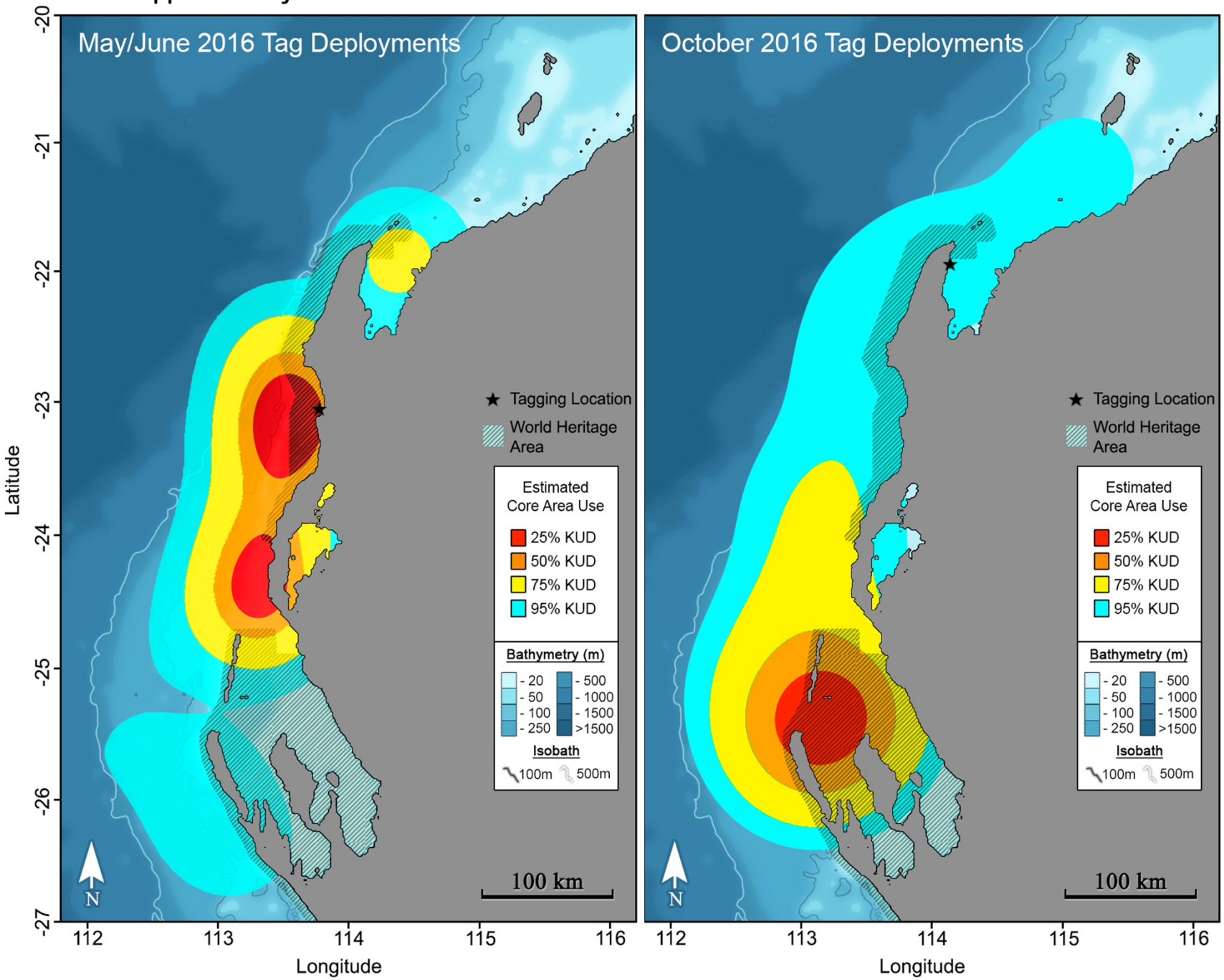

Supplementary Figure 16. Core area use for May/June 2016 tag tracks (left) and October 2016 tag tracks (right) represented by the 25%, 50%, 75% & 95% KUD estimates.

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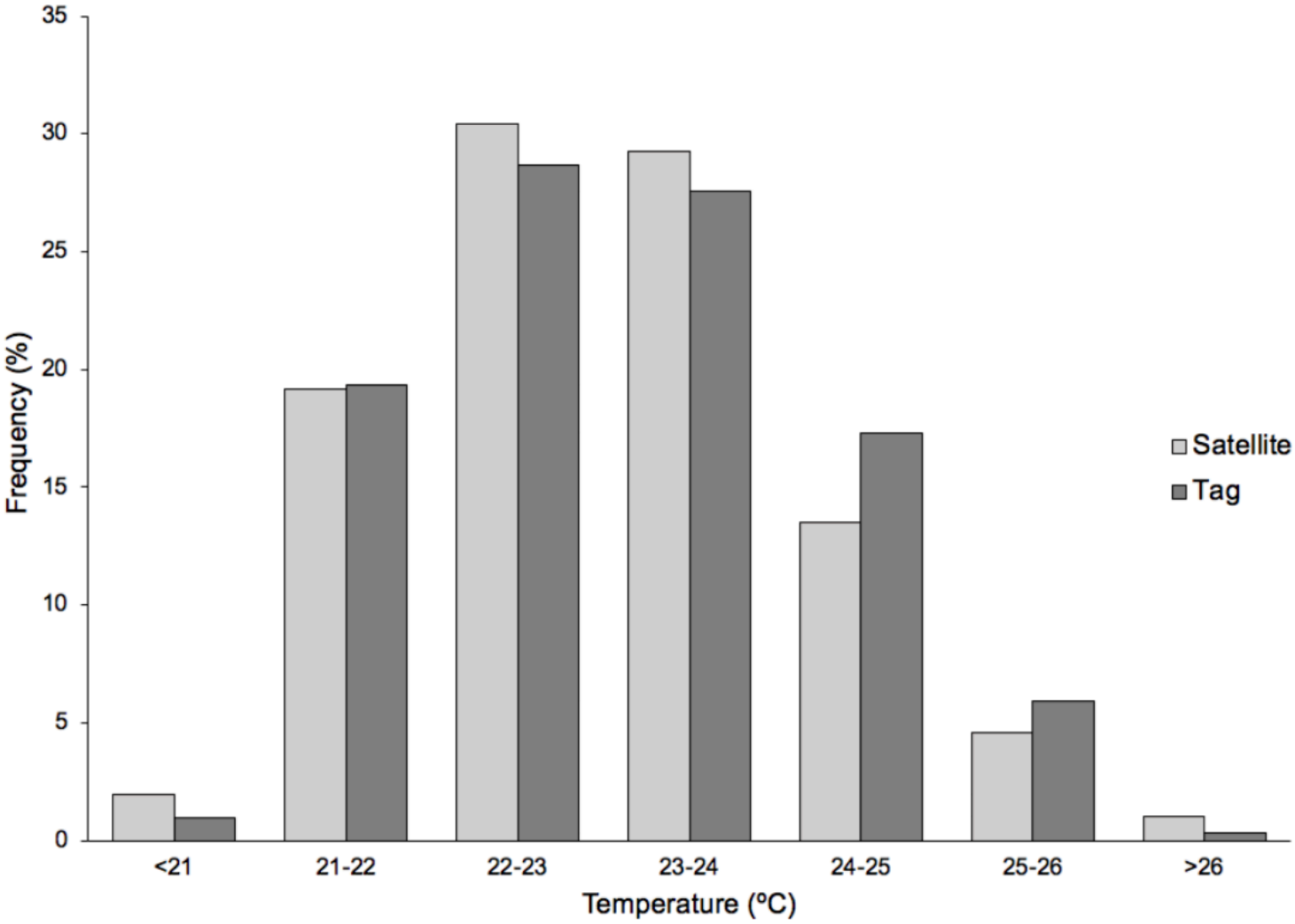

Supplementary Figure 17. Frequency of satellite derived SST (light grey) and vertically integrated tag observed temperature (dark grey) for 12 satellite tagged *M. alfredi.*

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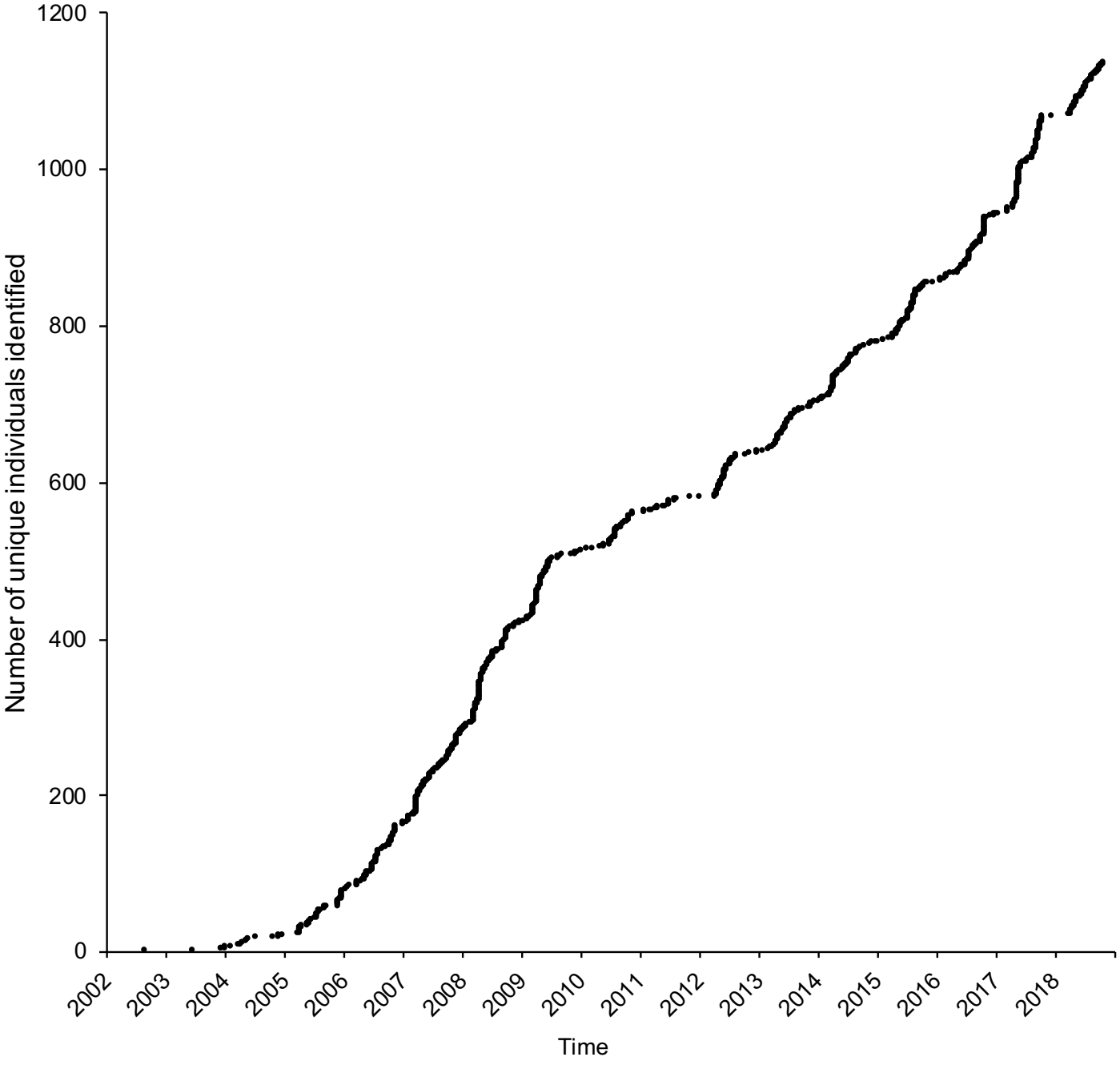

Supplementary Figure 18. Discovery curve showing the rate of new identifications through time.