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Project: Hoiho Population and tracking: POP2018-02
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Monthly report for the period 21 January – 20 February 2020

Summary

Tracking of hoiho during the post-guard stage had ended in mid-February. In this report we present the data that was recorded at Long Point, Catlins and Papanui Beach, Otago Peninsula; additionally, we provide an update on obtained dive data from a hoiho that was tracked via satellite in winter 2019. Two post-guard birds from Oamaru have been fitted with devices that transmit data through the cell phone network; however, recovery of these devices is still pending, we will report on these data in March. In the Catlins, four penguins from two active nests in Seal Bay, Long Point were successfully tracked in early January 2020 using GPS dive loggers. GPS data show that the sea regions to the Southeast of Long Point play an important role for the penguins. Diving behaviour in all birds showed substantial pelagic activity suggesting favourable mid-water foraging conditions. This may be related to the prevailing lower than average ocean temperatures this season creating massive swarms of Munida and krill. Similarly, five hoiho tracked in late January at Papanui Beach, Otago Peninsula showed some affinity for pelagic foraging. This behaviour was unrelated to the sea regions visited suggesting a patchy distribution of mid-water prey as it is common in swarming or schooling species. Foraging directions were somewhat variable although three of the five birds foraged in a distinct region stretching northeast from Papanui. The deepest dive – 129.1 m – recorded in hoiho from the Otago Peninsula has occurred during these deployments.

Results

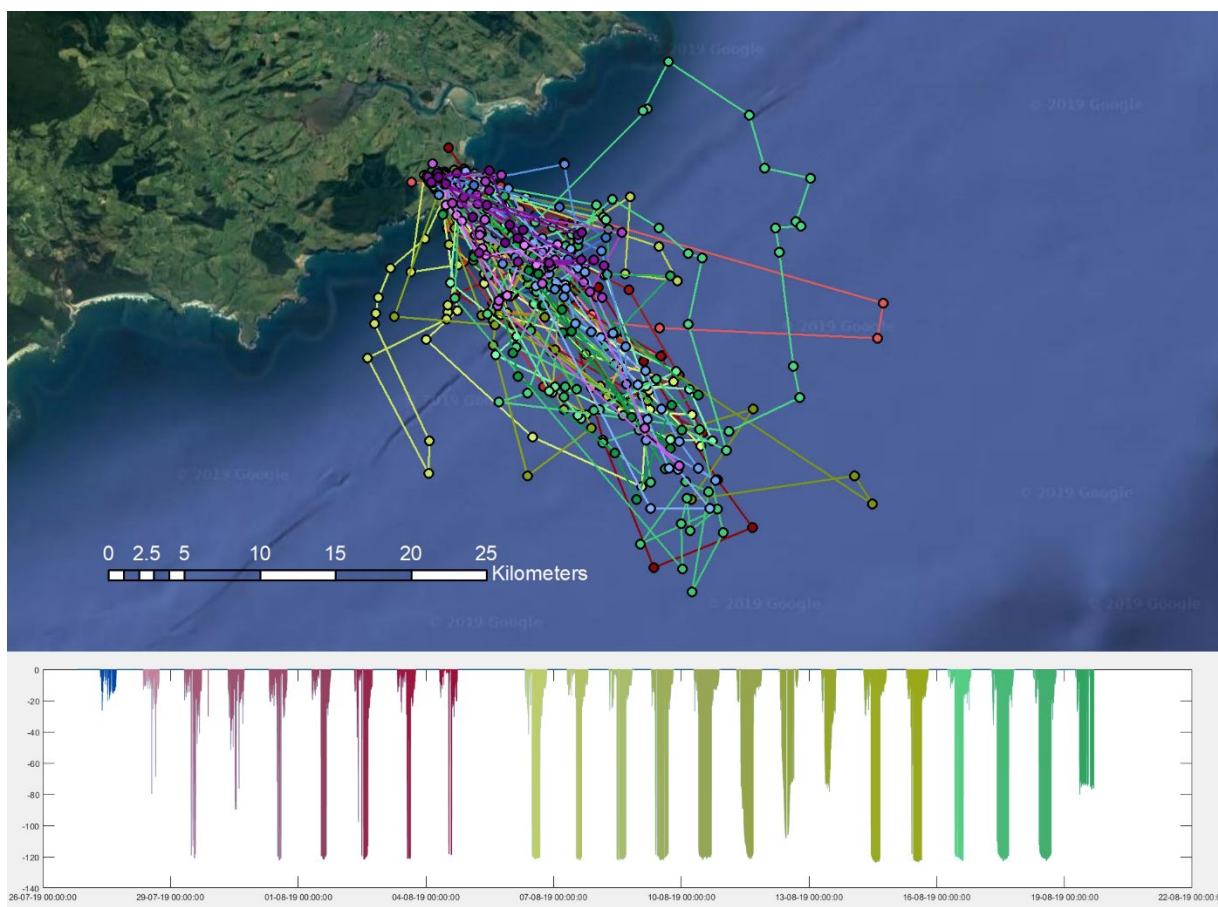
Penguin Bay, Catlins

Male, bird id: 982 000405532372, 5600 g, Satellite tag & AxyDepth, 28 July – 18 September 2019

We already reported on this bird in our September 2019 report. The penguin was fitted with a satellite transmitter to track its winter movements over a longer period. In addition, a dive logger was attached that had to be recovered to download dive data. Despite numerous attempts, the penguin could not be recaptured, and the satellite tag ran out of battery power ceased transmitting on 18 September 2019.

On 26 November 2019, the bird was found incubating on a nest in Penguin Bay by Cheryl Pullar. Both, the satellite transmitter and dive logger were still attached and recovered by Cheryl. The dive logger contained four weeks of continuous dive data; this represents the longest continuous dive data set recorded in any Yellow-eyed penguin.

The satellite data already suggested that the bird performed mainly one-day trips. The dive data confirms this. Over the entire four-week period, the penguin exhibited consistent diving behaviour with most foraging trips being characterized by benthic foraging. Pelagic dives generally occurred at the beginning and towards the end of trip, so that these shallower dives were most likely associated with travelling. With few exceptions, the bird searched for prey at around 120 m depth. A penguin fitted with a camera logger that foraged in the same region and the same depths in 2017 mainly caught sandfish; it can be assumed that this was also what this hoiho was pursuing.



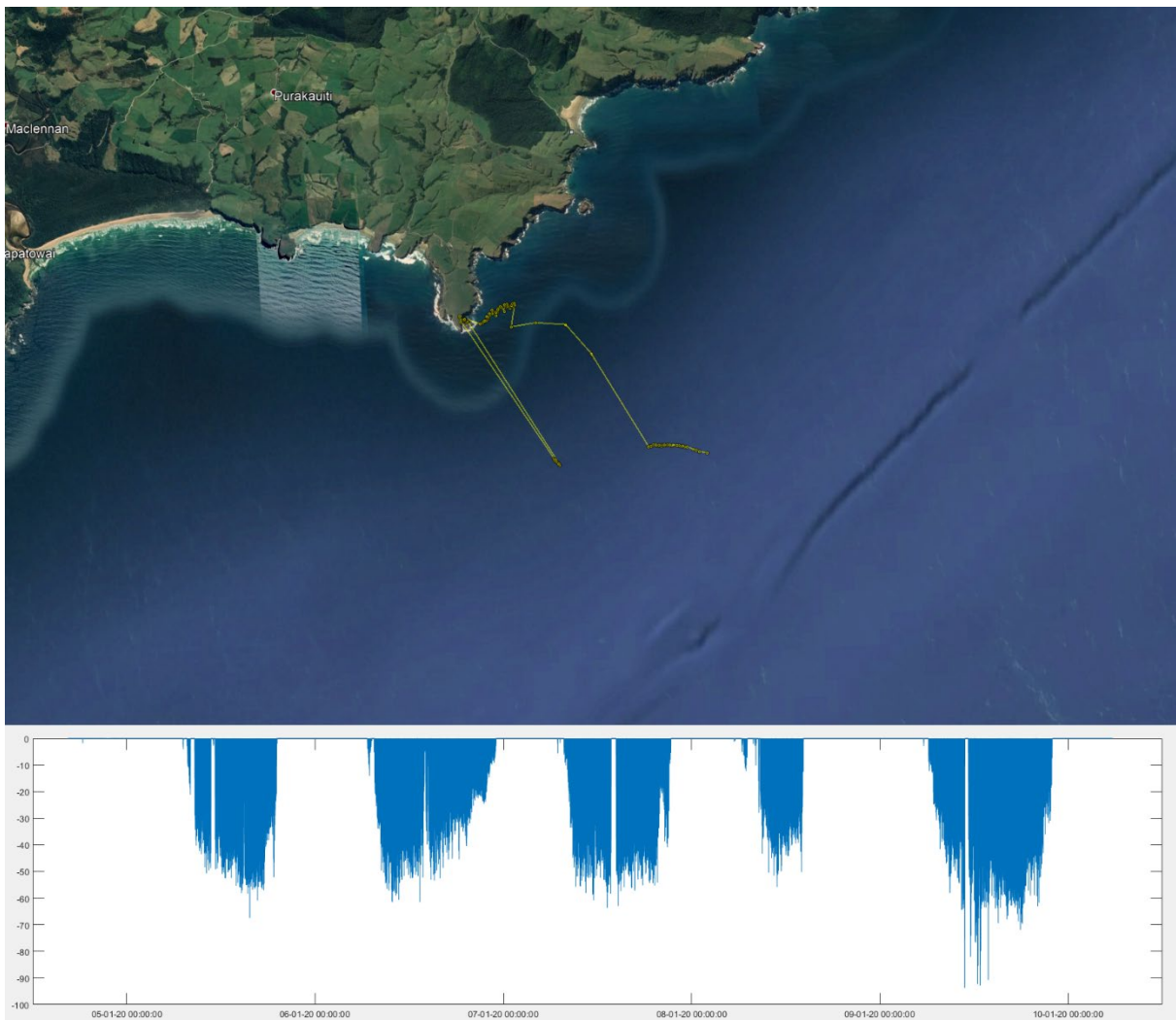
Foraging tracks and dive profiles of male 982 000405532372 recorded between 28 July - 18 September 2019.

Long Point, Catlins

Female, bird id: 982 000365941883, 5600 g, AxyTrek, 4-10 January 2020

At the time of the deployments only two nests were active in Seal Bay area at Long Point. The female penguin was caught when returning from a foraging trip on 4 January 2020, fitted with a GPS dive logger and released 50 m from her nest (LPSI1) to which she returned immediately. The device was recovered six days later.

Unfortunately, the GPS unit of the logger malfunctioned and recorded very few data points while the bird was at sea. However, full set of dive data could be recovered which showed that the penguin foraged predominantly pelagically around the 40 m depth mark. Only few benthic dives were recorded on its fifth and last foraging trip before device recovery. The fourth foraging trip (8 January) was a half day trip which saw the bird returning to its nest shortly after midday.

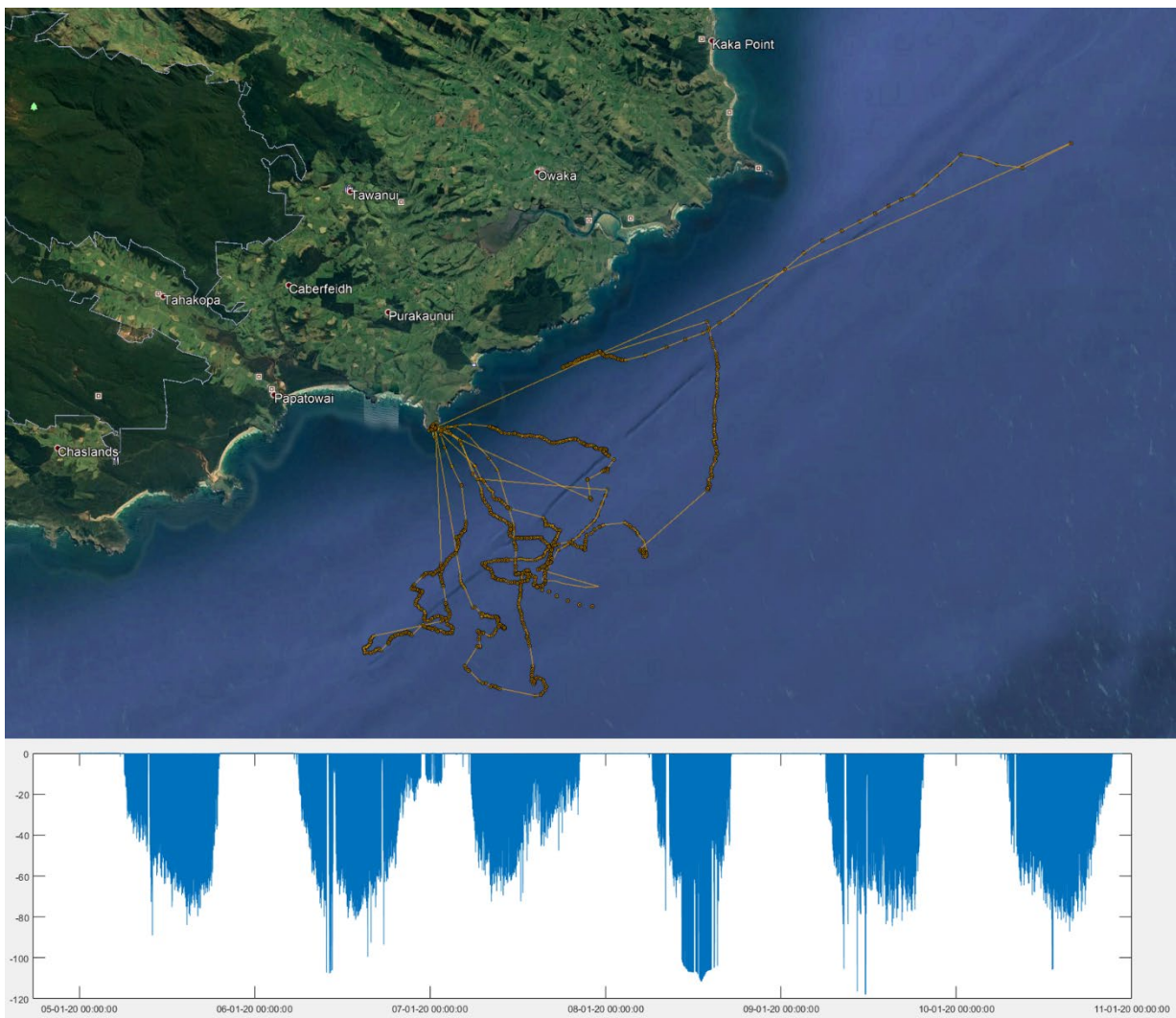


Foraging tracks and dive profiles of female 982 000365941883 recorded between 4-10 January 2020. Note that the GPS unit failed to record much meaningful data.

Male, bird id: 982 000063603716, 6600 g, AxyTrek, 4-11 January 2019

The male penguin was partner of above female (nest LPSI1) and was fitted with GPS dive logger on the same day as his partner, also shortly after returning from a foraging trip. The bird was recaptured and the device detached on 11 January.

The bird performed five foraging trips while fitted with device. All trips were one-day foraging trips, except for the second trip on which the penguin foraged northeast past Nugget Point and stayed at sea overnight. During one-day trips, it stayed within a 10-15 km radius to the South and Southeast of Long Point. Like its mate, the penguin performed primarily pelagic foraging dives at depths of 20-60 m. Occasional benthic dives were evident on all trips except for the second day of the overnight trip. On its third trip (8 January) the bird foraged along the seafloor at depths >100 m. Considering the similar dive behaviour when compared to its mate as, it seems reasonable to assume that both birds foraged in similar ocean regions. However, their departure times differed so that it seems unlikely that they foraged together.

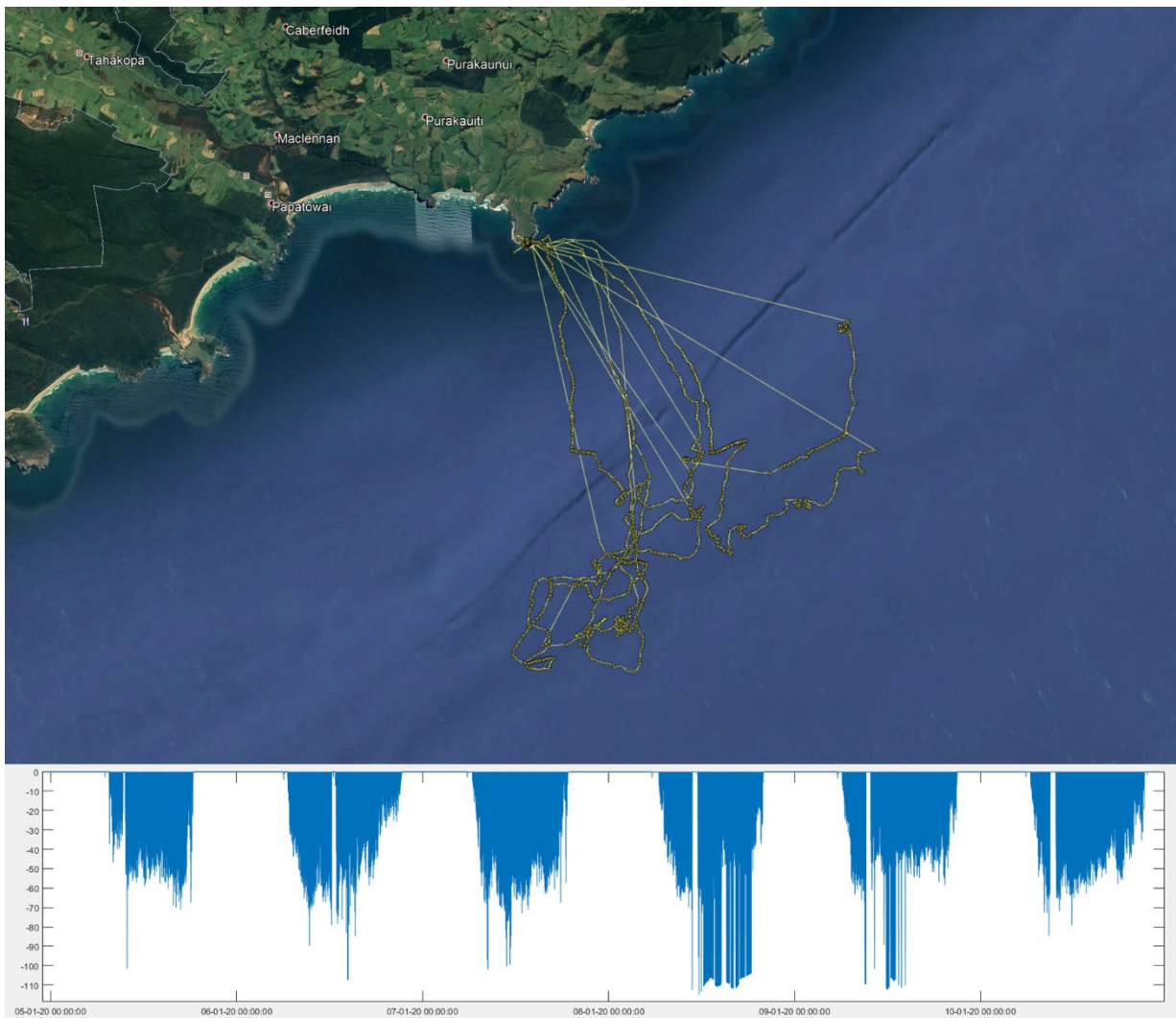


Foraging tracks and dive profiles of male 982 000063603716 recorded 4-11 January 2020.

Female, bird id: 982 000365999895, 5900 g, AxyTrek, 4-10 January 2019

The female hoiho from the second active nest (LPKE1) was caught shortly after the female penguin from the other nest had been fitted with a device. The bird was very calm during the deployment and headed straight to her nest upon release. The device was recovered six days later.

During the 7-day deployment detailed GPS and dive data could be recorded. The penguin performed six full day trips on which it foraged within a 17 km radius south to southeast of Long Point; she foraged in the same general area as the penguins from the other nest. Also, like those birds, she foraged principally pelagically between 40 and 60 m depths. Interestingly, she also assumed a primarily benthic foraging strategy on 8 January, i.e. on the same day as the male hoiho from nest LPSI1 reverted to benthic foraging. This suggests that the mid-water foraging conditions on that day were suboptimal making benthic foraging – the standard *modus operandi* in mainland hoiho – a more feasible strategy.

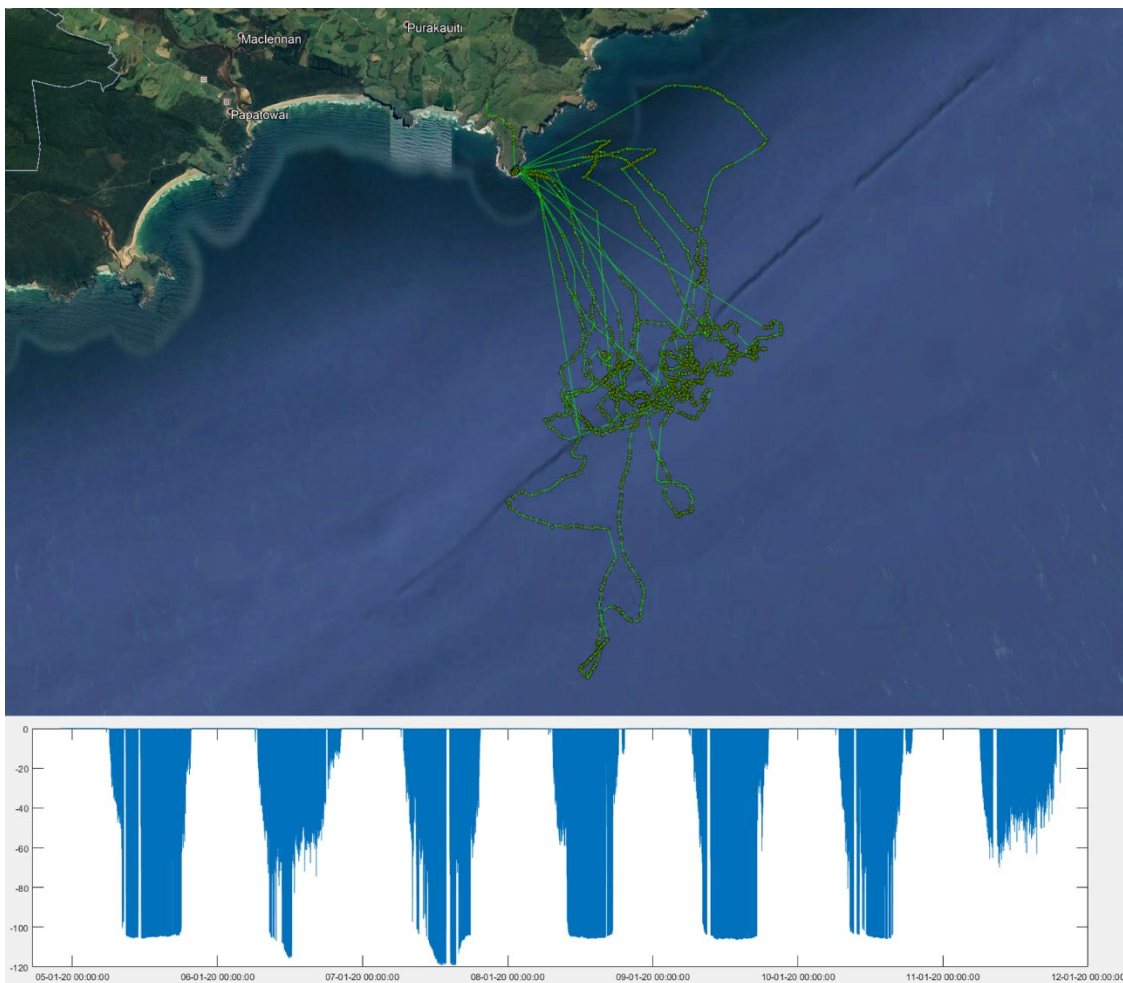


Foraging tracks and dive profiles of female 982 000365999895 recorded 4-10 January 2020.

Male, bird id: 982 000063615711, 6000 g, AxyTrek, 4-12 January 2019

The male hoiho belonged to nest LPKE1 and was fitted with a GPS dive logger on the same day as his partner. The device was recovered seven days later.

Like all other hoiho from this site, the penguin foraged 7-15 km south and southeast of Long Point underlining the importance of that region to the local hoiho population. It performed seven one day foraging trips. However, unlike the other three birds, this penguin engaged primarily in benthic foraging reaching dive depths of 100-120 m. The deepest depths were recorded when the bird travelled close to the continental shelf edge about 16 km due south of Long Point. Only on the last trip the penguin switched to exclusive pelagic foraging searching for prey at the same depth range as the other pelagically foraging penguins (40-60 m).



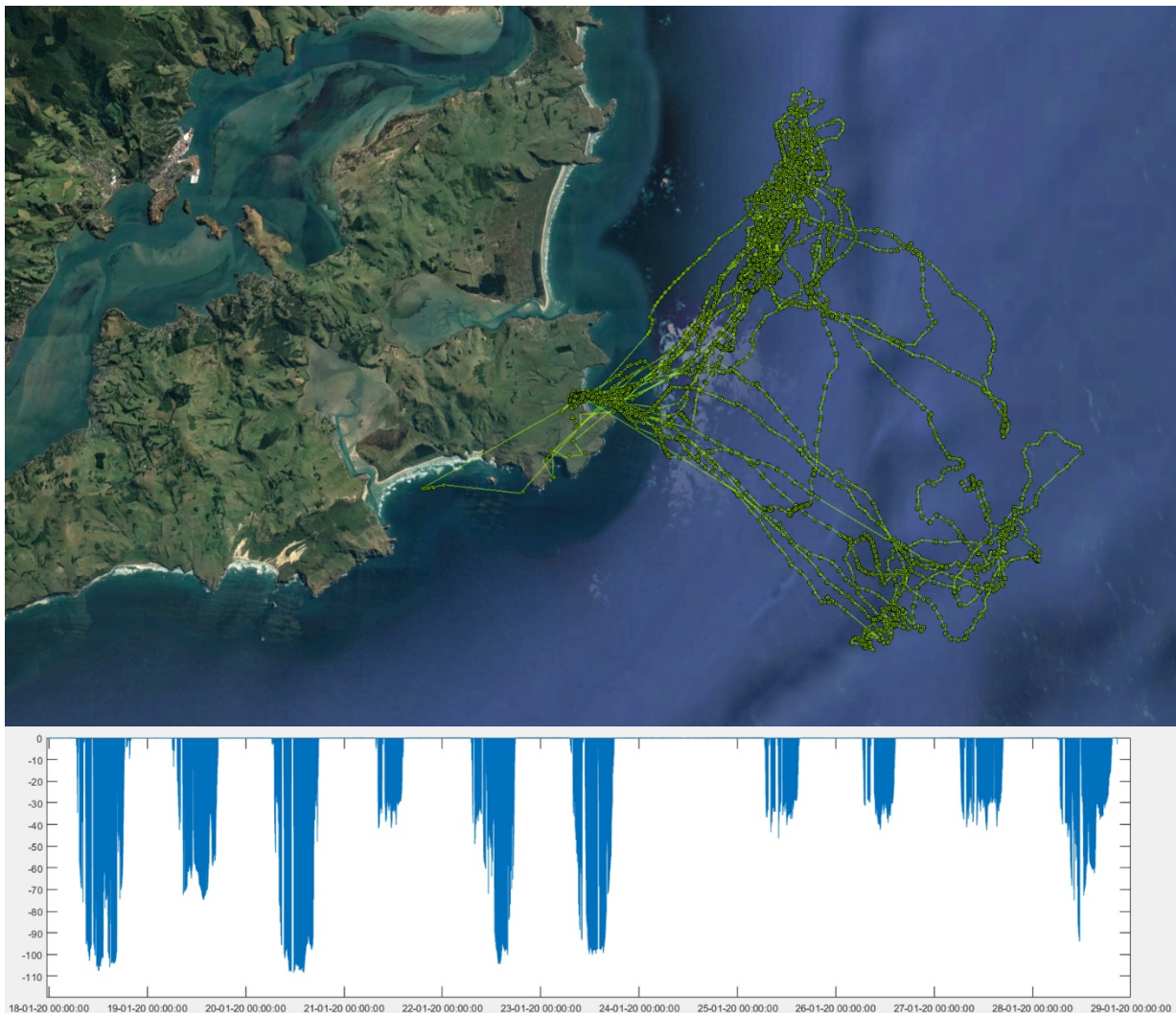
Foraging tracks and dive profiles of male 982 000063615711 recorded 4-12 January 2020.

Papanui Beach, Otago Peninsula

Female, bird id: 982 000063627881, 5200 g, AxyTrek, 16-28 January 2020

The female penguin was found lingering at the bottom of the hill close to another penguin and showed little intention to move back to its nest (M2). It appeared as if the bird had been attending the nest in the morning to feed its chicks. It was fitted with a GPS dive logger around 8 pm on 16 January but only left on its first foraging trip in 18 January. The device was recovered in the evening of 28 January with the device still recording data.

GPS and dive data represent 10 full foraging trips. During the deployment period the penguin showed two different foraging strategies. During the first week, it foraged in an area 7-12 km to the Southeast of Papanui Beach. During these trips, the penguin dived predominantly along the seafloor reaching depths of up to 110m. SE trips were evident on 18-20 January and again 22-23 January. On 21 January as well as the three trips after a day on the nest on 24 January, the penguin foraged to the Northeast staying within 7 km from the coast and diving pelagically between 20 and 40 m depths. The last recorded foraging trip was a mix of both foraging strategies; the penguin foraged to the East along the seafloor reaching depths of 90+ m, before moving to the area it had visited on the previous days and reverted to a pelagic foraging strategy.



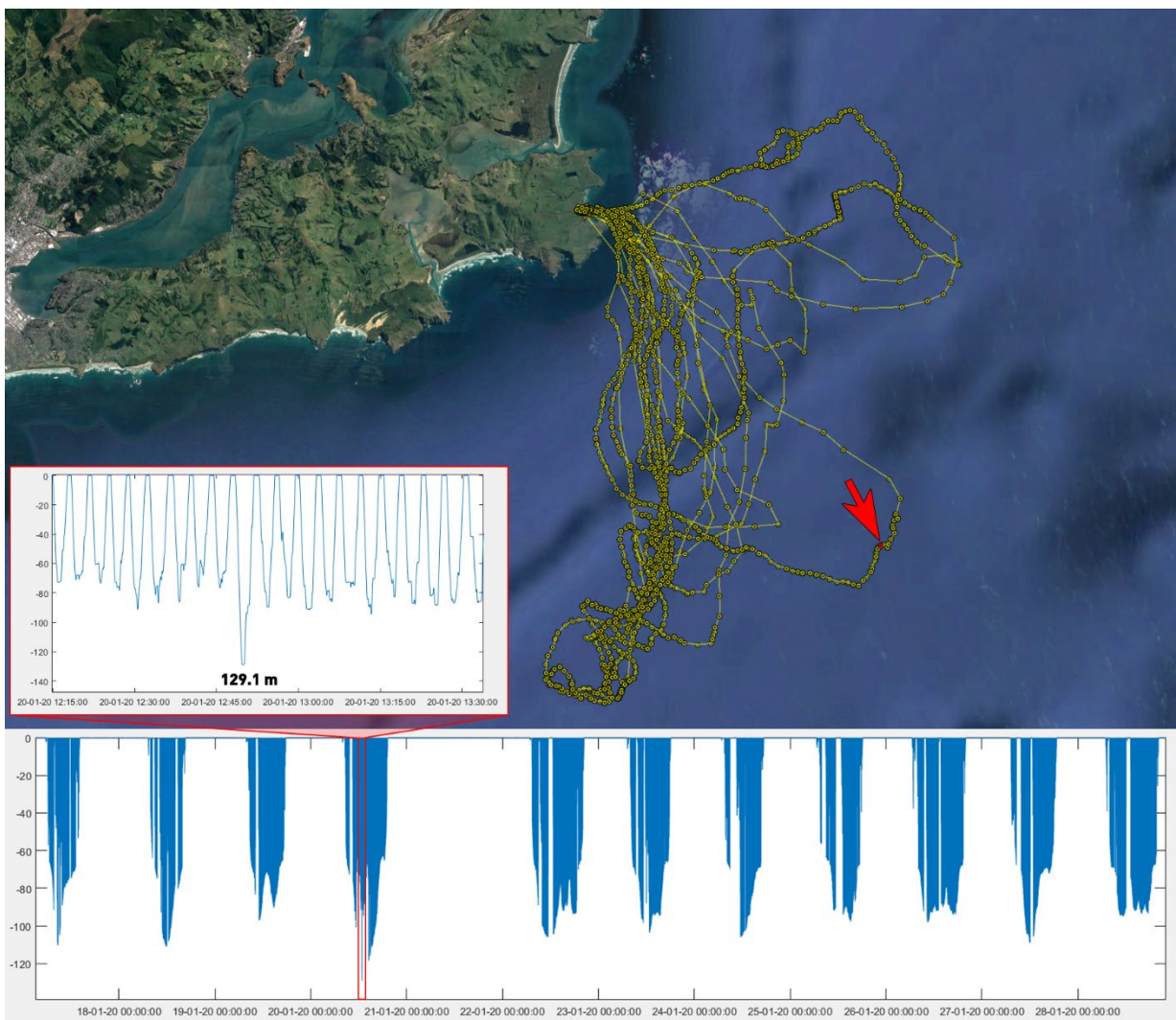
Foraging tracks and dive profiles of female 982 000063627881 recorded between 16-28 January 2020.

Male, bird id: 982 000063629359, 5900 g, AxyTrek, 16-28 January 2020

The male penguin, also from M2, was encountered near the nest in the afternoon. It appeared in good condition and was fitted with a GPS dive logger.

The bird performed a total of 11 single-day trips during the deployment period. It foraged across a reasonably broad range covering an area stretching around 12 km east of Papanui to 15 km due south of the beach. However, it showed an affinity for the southern regions where a lot of GPS fixes were recorded.

Throughout its trips, the penguin foraged at the seafloor at depths of 80-110 m. Particularly noteworthy is a single deep dive to 129.1 m which represents the deepest dive recorded for a hoiho from the Otago Peninsula. Apart from the depth reached, it is interesting to note that the bird exhibited pelagic diving behaviour for about 30-35 minutes before and after that deep dive. This was the only time the bird engaged in pelagic foraging during all its trips. This suggests that the bird encountered and exploited a school of pelagic prey during this period.

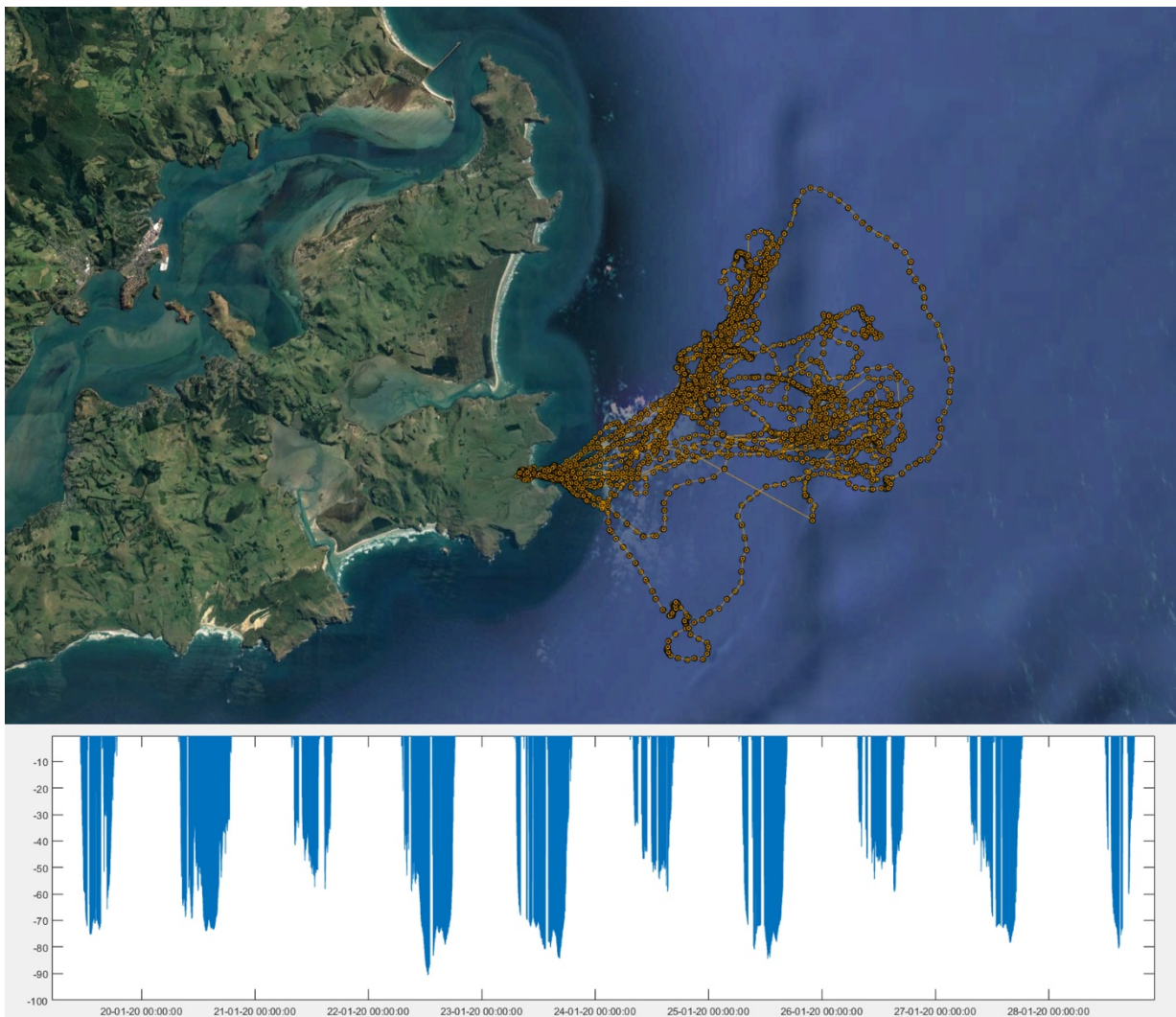


Foraging tracks and dive profiles of male 982 000063629359 recorded between 16-28 January 2020. Red arrow and place marker indicate location of deepest dive; inset shows 45 minutes of primarily pelagic foraging dives centred around the single deep benthic dive to 129.1 m.

Female, bird id: 982 000405532175, 6000 g, AxyTrek, 16-28 January 2020

The female was fitted with a GPS dive logger at its nest (WILMA'S) containing one healthy chick in the early evening. The device remained on the bird for 12 days and was recovered on 28 January.

The penguin undertook a total of 10 one-day trips during which it foraged principally due east within a 12 km radius from Papanui Beach. On its trips, the penguin showed a mix of benthic and pelagic dives during which it dived not deeper than 90m. The variable diving behaviour suggests that the bird occasionally encountered pelagic prey patches that it went after for a while before resuming the benthic foraging strategy that is so characteristic for mainland hoiho. In fact, this seems to reflect foraging strategies that have been observed in hoiho from the Auckland Islands. Therefore, foraging conditions this season – which seem very favourable for hoiho due to the lower than average ocean temperatures – may be reflective of those in the subantarctic.



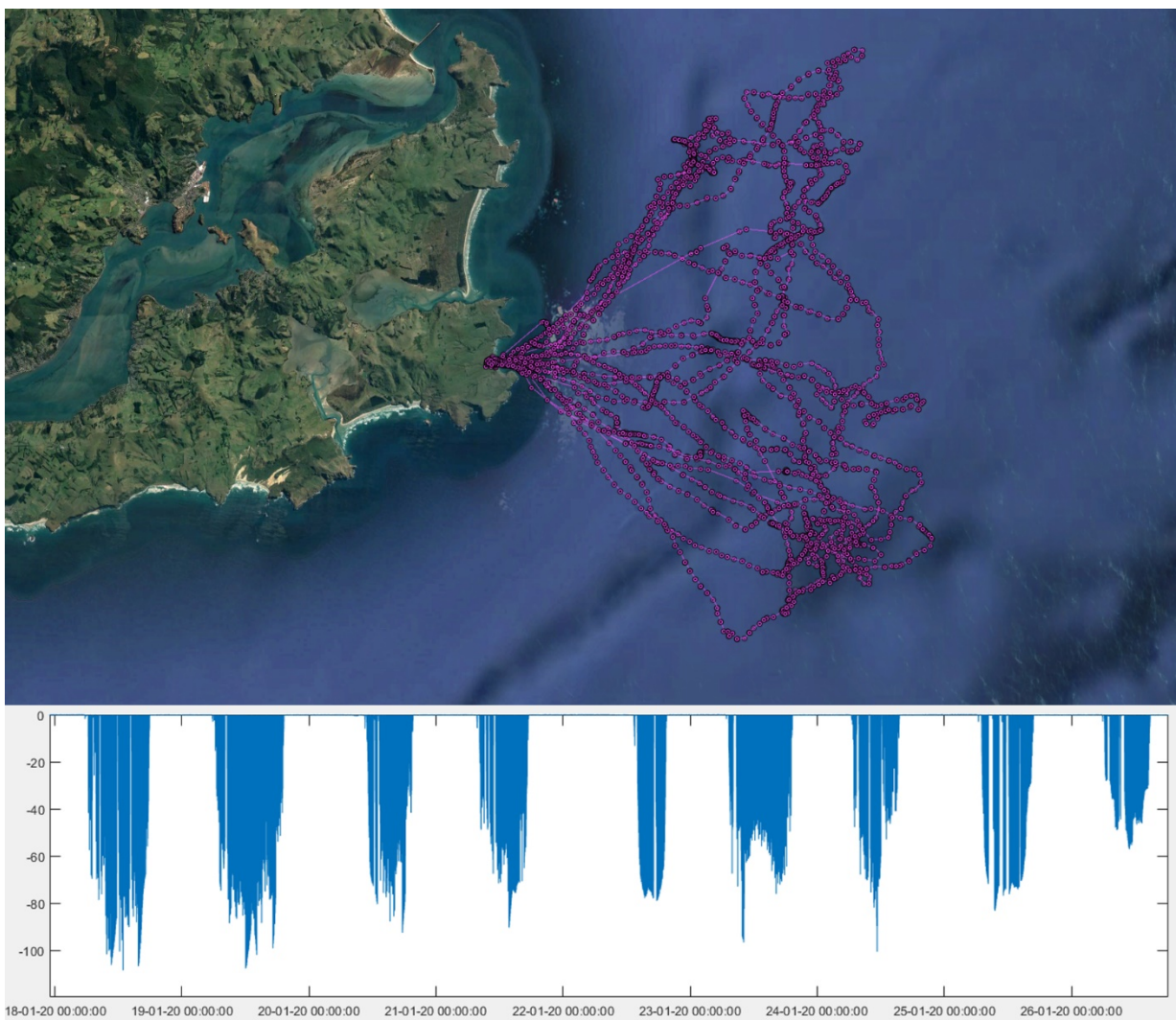
Foraging tracks and dive profiles of male 982 000405532175 recorded during chick guard 16-28 January 2020.

Male, bird id: 982 000402100873, 6100 g, AxyTrek, 16-28 January 2020

The male penguin from nest WILMA'S was captured and fitted with a GPS dive logger in the afternoon of 16 January. The bird was in excellent condition and was very alert. It was recaptured in the early evening of 28 January.

The penguin left on eight one-day trips and one half-day trip while fitted with a GPS dive logger. Of all the Papanui birds tracked, the male showed the greatest variability on its at sea distribution. It foraged in an area ranging from North-east to South-east of Papanui Beach, generally staying within a 15 km radius from its breeding colony. Interestingly, on two trips the bird foraged due northeast of Papanui along a reasonably narrow stretch about 6 km from Victory Beach; this area was also visited by its mate (982 0004045532175) as well as the female from nest M2 (982 000063627881) indicating an important foraging zone for hoiho there.

It performed predominantly pelagic dives with intermittent benthic episodes that brought the bird beyond the 100 m dive threshold.

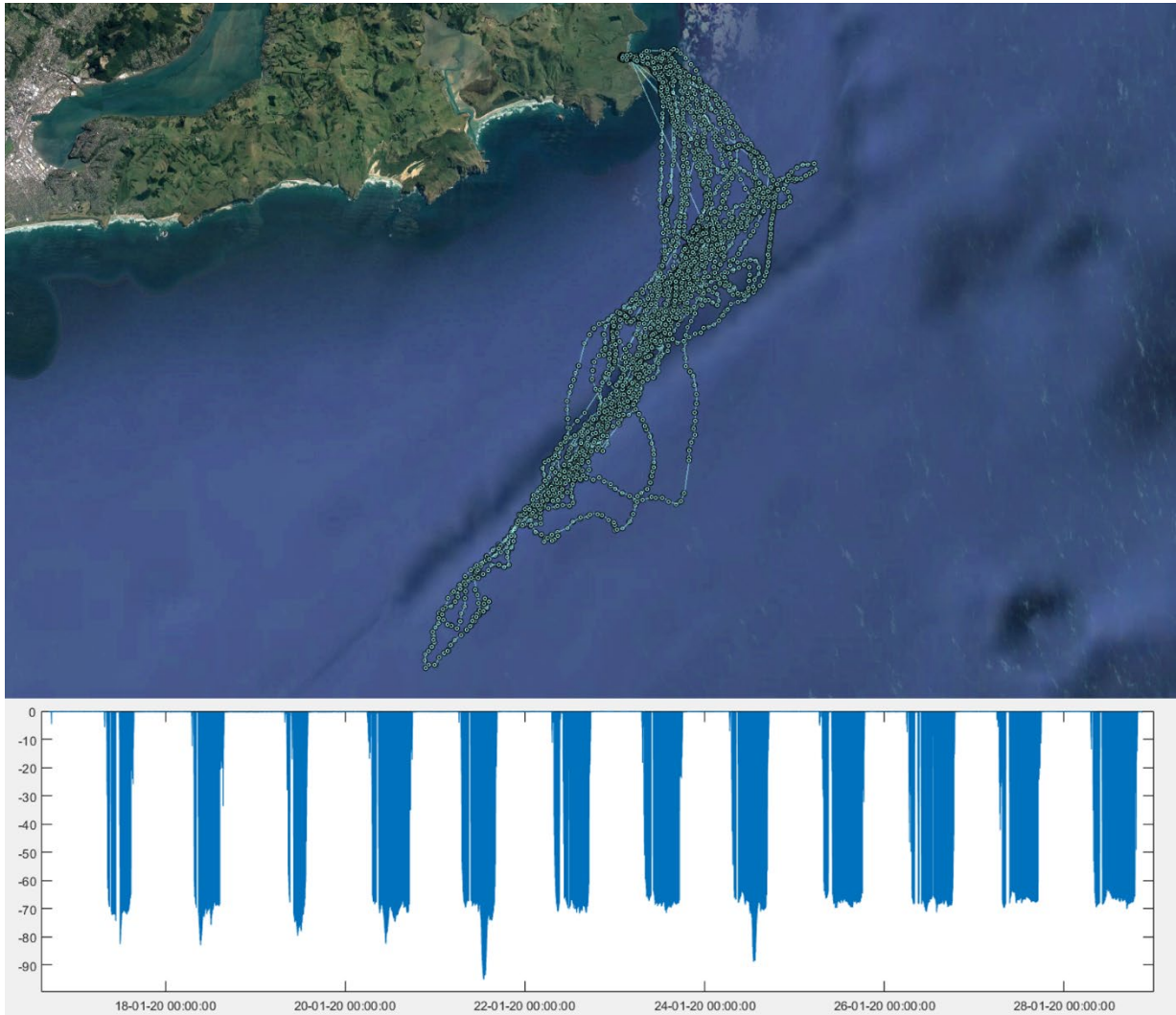


Foraging tracks and dive profiles of male 982 000402100873 recorded between 16-28 January 2020.

Male, bird id: 982 000365941853, 6100 g, AxyTrek, 16-28 January 2020

The male penguin was caught at nest M3 in the afternoon of 16 January where it had just completed feeding its two chicks as evidenced by food stains around its bill region. The bird had a minor laceration on the outside of its cloaca but appeared in excellent condition otherwise. It was fitted with GPS dive logger; the bird was recaptured in the evening of 28 January.

In contrast to the other penguins, this hoiho exclusively foraged to the South of Papanui beach, principally concentrating its foraging effort in a narrow area stretching southwest along the 70 m depth contour. The penguin foraged exclusively at the seafloor with very few pelagic dives at the start and end of its trips.



Foraging tracks and dive profiles of male 982 000365941853 recorded between 16-28 January 2020.

Next steps

This report covers data recorded on the mainland during the post-guard stage. Tracking effort is currently covering the pre-moult phase. Currently, penguins from Bobby’s Head/Tavora are being tracked with further deployments planned for the Catlins in the coming weeks.