Remote-sensing, biologging and other innovative electronic technology reveal new aspects of penguin ecology and biology

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Penguin are flightless, diving seabirds that generate considerable interest amongst the general public, conservation groups, scientists and marine policy advisors. This interest means that many species are well studied, with different aspects of their biology and ecology well researched. However, away from land, important aspects of their ecology still remain poorly understood. In this talk we explore how new technology has helped reveal different elements of their behaviour and ecology, with much of this previously unknown.

We show how the use of satellite remote sensing has now provided revised information about the breeding distribution and population sizes of various different penguin species, so that these are now much better understood. For example, we show how satellite surveys have helped revise emperor penguin population data so that we now know that there are 53 colonies of emperors with a breeding population of more than 238,000 pairs; almost twice that previously recognised. We also show how remote sensing can also reveal previously unknown behaviours for emperor penguins, some of which may help them accommodate to an environment subject to climate variability and change.

We also show how micro-electronic biologging technology has helped reveal other aspects of penguin life at sea. This technology not only helps provide better understanding of where penguins spend their time when they are away from their breeding colonies, but also how they utilize different aspects of their available marine habitat. For example, we show how emperors utilize sea ice whilst foraging to provision their offspring.

Use of biologging technology with other penguin species has also revealed where they preferentially forage, so that we can now develop preferred habitat models and better understand the critical habitats used by different penguin species at different times of year.

Use of new technology has helped us to improve our understanding about the different risks that penguins might experience. For example, evidence from new technology was vital for the IUCN when it recently re-assessed the threat status of all different penguin species. Importantly, objective scientific evidence provided to an international scientific group facilitated the revision of threat assessments so that these would better describe the status of each penguin species. For example, remote sensing data has revealed that Adélie penguin populations are larger than previously supposed, such that their status is less concerning that previously believed.

Such objective scientific evidence is especially vital when policy makers consider how to manage potential threats to different penguin species, for example, how penguins might respond to humans where they come into contact with tourists, scientists or fisheries that target the same species as penguins.