

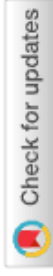
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Acoustic ecology of Adélie penguins in the West Antarctic Peninsula **FREE**

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Adélie penguins (*Pygoscelis adeliae*) are bioindicators for the rapidly changing Antarctic environment, making understanding their population dynamics and behavior of high research priority. However, collecting detailed population data throughout the breeding season on many colonies is difficult due to Antarctica's harsh conditions and remote location. The colonial breeding ecology of Adélie penguins has led to the evolution of a highly vocal species with individualized calls, making them well-suited for passive acoustic monitoring (PAM) with autonomous recording. PAM units can potentially provide an easily deployable and scalable way to collect fine-scale data on population estimates and breeding phenology. Here I present a framework for using acoustic indices to monitor phenology of dense penguin colonies even under high wind conditions. I evaluate the relationship between acoustic indices such as RMS amplitude and penguin colony size between distinct breeding stages (incubation, guard, crèche, and fledge) on Torgersen and Humble Islands in the West Antarctic Peninsula with an automated pipeline implemented in R. Using PAM to interpret penguin vocalizations for population size and breeding phenology estimates could lead to the development of a real-time remote monitoring system over a large spatial footprint, revealing Adélie penguin responses to climate change.