

# Citizen scientists capture penguin breeding dynamics

June 27 2018

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Using data from nearly 74,000 images, volunteers have helped Oxford University researchers to capture and better understand, the breeding habits of penguin breeding colonies across the Antarctic Peninsula, South Shetland Islands and South Georgia. Credit: C.Arteta

Using data from nearly 74,000 images, volunteer armchair scientists have helped Oxford University researchers to capture and better understand, the breeding habits of penguin breeding colonies across the Antarctic Peninsula, South Shetland Islands and South Georgia.

The study features in *Scientific Data*, and was undertaken as part of Oxford's "Penguin Watch" programme, which runs as part of the Zooniverse—the world's largest and most popular volunteer science platform.

Now in its fourth year of operation, "Penguin Watch" allows the public access to thousands of images of penguins from more than 30 colonies around the world, and enables them to contribute to vital conservation research. To date, "Penguin Watch" has processed over six million images that have been classified by over 49,000 registered volunteers and a wealth of anonymous participants.

As part of this latest project, images of brush-tailed penguins, were taken and collated from 15 different cameras, and then classified by the volunteers.

Due to the challenges involved in monitoring a harsh, remote environment like Antarctica, most studies investigating penguin population dynamics have focused on a specific location, or collectively several locations, with subsequent extrapolation of local data to cover a wider region or regions.

However, more comprehensive data is needed to understand the dynamics of widespread penguin populations, and citizen science plays a key role in this area.

Better understanding penguin population dynamics, reproductive success, and phenology is vital to effective conservation of these animals, particularly in terms of monitoring and managing the impact of threats, such as climate change and over-fishing.

The research presents [volunteer](#) classifications for the 73,802 images, alongside associated metadata, including date, time, and temperature

information. Each camera in the Penguin Watch network generally captures images once per hour, between 7am and 8pm, year-round.

Volunteers support the research by classifying [images](#) and tagging individuals and labelling them as 'adult,' 'chick,' or 'egg' for penguins, or 'other' to indicate the presence of other animals, humans, or ships. This level of description allows the researchers to understand important phenological stages, such as chick hatching.

Fiona Jones, lead author, Penguinologist and PHD student, said: "Our research is a clear example of [citizen science](#) in action and the positive results that it can support. Citizen science is vital to penguin conservation and has the potential to make scientific research and innovation more responsible in the long term. In addition to the benefits for ecological monitoring, this type of annotated time-lapse imagery can be employed as a training tool for machine-learning algorithms to automate data extraction. Also, the project is an excellent way to engage with the public, enabling them to learn about Antarctica, penguin ecology and the scientific process."

**More information:** Fiona M. Jones et al. Time-lapse imagery and volunteer classifications from the Zooniverse Penguin Watch project, *Scientific Data* (2018). [DOI: 10.1038/sdata.2018.124](https://doi.org/10.1038/sdata.2018.124)

Provided by University of Oxford

Citation: Citizen scientists capture penguin breeding dynamics (2018, June 27) retrieved 27 April 2024 from <https://phys.org/news/2018-06-citizen-scientists-capture-penguin-dynamics.html>

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