

# Classify penguin adults, chicks, and eggs for penguinwatch.org



Gentoo colony on Booth Island (credit: Fiona M. Jones)

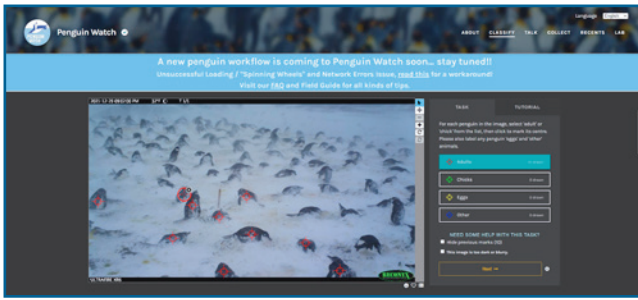
Help researchers identify penguin adults, chicks and eggs in photos taken in Antarctica and sub-Antarctica by time-lapse cameras for the benefit of penguin research and conservation. University of Oxford researchers are crowdsourcing image processing, with global implications for penguin management.

Globally, seabirds are in decline, and even in Antarctica most penguin species are in decline. Conservation policy is often undermined by a lack of evidence, particularly in such remote regions. Without effective conservation underpinned by a strong understanding of the situation, the Antarctic Peninsula could be very different in 50 years.

A basic premise of wildlife conservation is that we need to be able to audit populations – to record whether they are stable, increasing or declining. This 'data gap' is particularly evident when we need to understand which of several possible threats are actually affecting the environment.

Along the Antarctic Peninsula and the Scotia Arc, Chinstrap and Adélie penguins are showing rapid declines, while Gentoo penguins and whales are slowly increasing. We now need to understand whether fishing, climate change or direct human disturbance is causing these changes – but how? Conventional monitoring is logistically difficult and hugely expensive in Antarctica, because it usually requires a summer camp or a scientific base. However, many of the sites are visited by tourists or scientists once a year. Since 2010, Dr Tom Hart from the University of Oxford, Department of Biology has been using International Association of Antarctica Tour Operator (IAATO) vessels to access sites all around Antarctica to install and service time-lapse cameras that record penguin behaviour and breeding success year-round.

**Start classifying penguin images now on [penguinwatch.org](https://penguinwatch.org).**



These cameras overlook penguin colonies and automatically take multiple images a day and can therefore record the number of penguins turning up to breed (and when they arrive), the timing of breeding and chick survival. By increasing the number of images, these cameras can even record how long penguins spend at sea foraging for food, and how often they feed their chicks. This is a sensitive, early warning indicator of stress that allows us to compare many areas and work out which threats are causing declines and which areas are fundamental for population survival. However, the real trick is what to do with the sheer number of images collected every year. Dr Hart's team now monitors over one hundred sites around the Southern Ocean. Collaborators in the US, Argentina and Australia monitor even more. The team collects over 500,000 images per year and the 'data deluge' is increasing. That's where the Zooniverse (the world's largest and most popular platform for people-powered research) stepped in – another Oxford University project based in the Department of Physics. The team at Zooniverse developed *Penguin Watch*, a citizen science project which allows volunteers to click on penguins and process valuable data.

In the first year of launch, Penguin Watch had over two and a half million hits, processing nearly half a million images and counting over 50 million penguins! Over 10 million images have now been classified, and some of this information is being used to train an automatic recognition tool. Some of the evidence produced helped create and design the South Georgia and South Sandwich Marine Protected Area in 2013, then the largest MPA in the world, and helped increase the area of protection around the South Sandwich Islands in 2018. The techniques associated with this project has also been spun out to remote places around the world like the Arctic and the British Isles and other species like guillemots, kittiwakes, seals, and polar bears.

Tom Hart receiving a specimen overlooking Neko Harbour Gentoo colony (credit: Alex Dalry Clark)



Chinstrap penguin and chicks (credit: Ignacio Juarez Martinez)

"Animals are basically very good at survival – that sounds obvious, but it's important. It means that population counts are slow to respond – they record problems that have already happened. Just like us, animals work very hard to raise their young. Recording how hard they have to work and how many offspring survive is a much more sensitive indicator of environmental stress than adult mortality." Therefore, on top of population surveys, we need more of these sensitive, early-warning indicators to compare fished versus unfished, visited and unvisited sites to work out what is causing declines."

*Dr Tom Hart, Penguin Watch*

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Thank you so much – your generosity helps us to continue this work and is much appreciated.