



**Heading:** Penguin Poo From Space  

**Tags/crossover topics – e.g. it might be listed in Land but also be relevant for Ocean, Biodiversity/Human Impacts could also be tags:**

Biodiversity  
Land  
Polar

### **Introduction:**

Scientists who study planet Earth (Earth and environmental scientists) have lots of different tools and techniques to understand our planet, how it works and how it's changing. Sometimes it can be best to carry our scientific research and investigations in-person – by going to the place you want to find out more about. But sometimes, this can be really difficult because the place is remote, costs a lot of money to get to or is challenging because of the weather or physical conditions involved in the travel or at the site itself.

Antarctica or the South Pole, where penguins live, is one of these locations. For example, the temperature can drop to  $-50^{\circ}\text{C}$ ! Whilst lots of Polar scientists do visit Antarctica, for example, to study wildlife or extract ice cores, there are lots of different ways scientists can study Antarctica and one of them is satellites.

Satellite data - such as that from the Copernicus Sentinel-2 – is being used to track, monitor and discover wildlife in Antarctica from Space, including penguins.

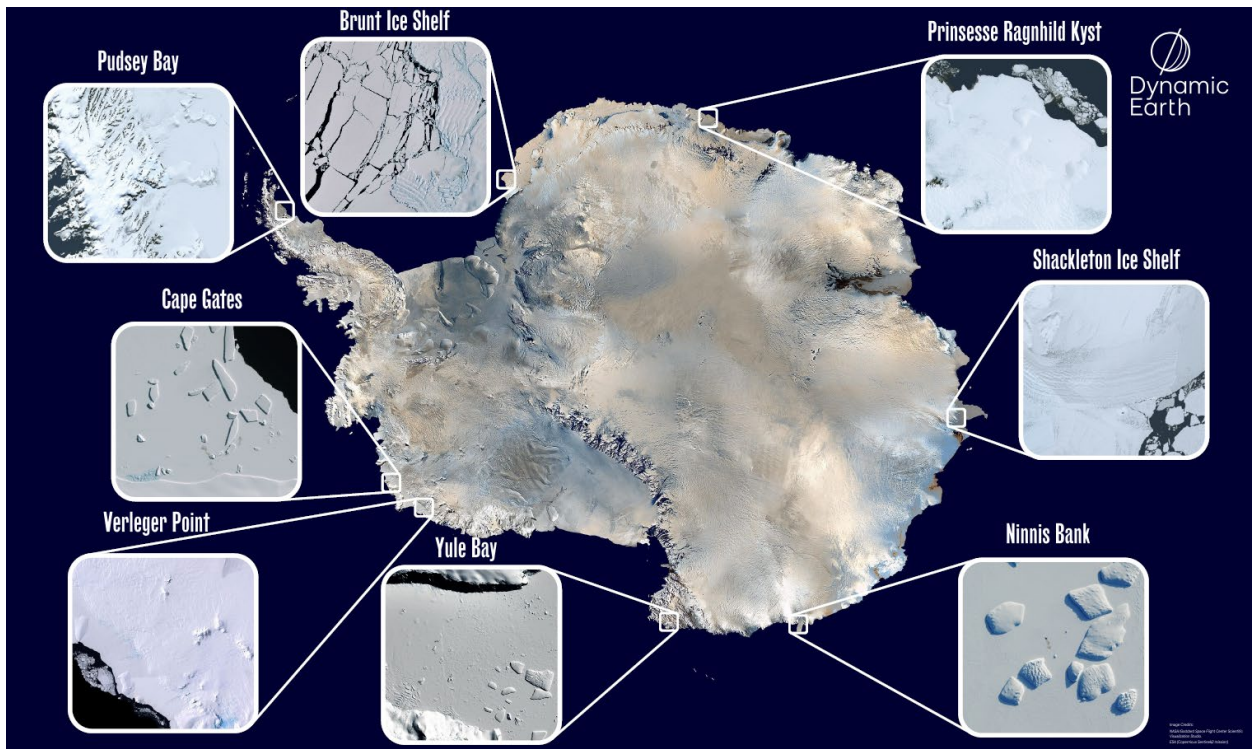
Whilst penguins themselves can be too small to show up on satellite images, their poo (or guano) can be spotted in satellite imagery. Penguin poo stains/patches across Antarctica have allowed scientists to track penguin populations across the entire continent, and even discover new ones!

In this activity have a go at spotting penguin poo from space for yourself.

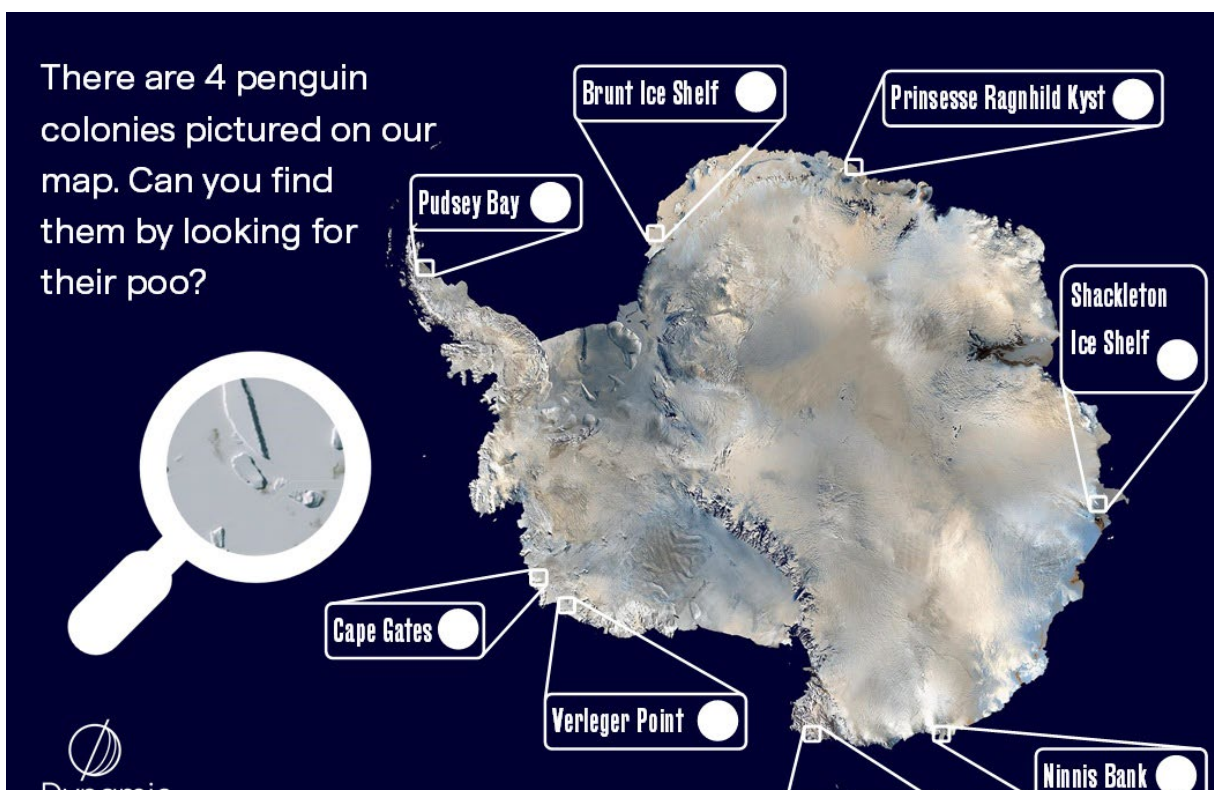
### **Kit list and any templates:**

Dynamic Earth have developed a series of templates for this activity to be delivered either as a floor mat activity, in small groups in a table top setting or individually.

- Print this graphic as a floor mat (recommended dims' 2m x 1.3m on PVC/Vinyl unhemmed) or as an A3 print out in colour. **Cost of a floor mat will be circa £60 + vat.**



- Provide suitable activity instruction and contextualization whether through live science communication or associated interpretation. For example, “Satellite data has been used to locate penguin colonies in Antarctica through spotting their poo! We’ve got some detective work for you to do – can you look at the 8 different images and see if you can find any signs/evidence of penguins through their poo stains?”
- Use the answer cards to tick off (potential to laminate and use whiteboard pens for re-usability) locations people can spot penguin poo or use [plush penguins](#) or toy models to place penguins on the locations where they think they are.





### Method:

- Set-up activity as desired for either drop-in or workshop format, individual or group working.
- Contextualize activity e.g. where do penguins live? How many different species are there? Bring in ideas of tracking/monitoring through satellites
- Introduce activity and run as desired

### Differentiation - how can this be adapted for different audiences:

- Pitch/scaffold as appropriate e.g. how much help to provide with identifying penguin poo Vs other geographical features of Antarctica
- Potential to introduce climate change stories e.g. Brunt Ice Shelf and using satellite data to track impact(s) on penguin colonies.
- Follow-up information can tailor stories appropriate to audiences interests and age e.g. Polar exploration, differences between the Antarctic and Arctic, differences between species of penguin, NERC Halley Research Station etc.

### Learning outcomes or discussion prompts:

- Antarctica is remote and challenging to get to. Whilst scientists can visit in person to carry out research, there are other tools in their armoury to help them, including satellites.
- Scientists can use satellite data to monitor and track penguins in Antarctica, by looking for their poo.
- Researchers can use computer code to scan satellite images for different colours of penguin poo, as the build-up of poo on the surface of Antarctica can be seen from space.
- Satellite data has revealed homes of new penguin colonies previously undiscovered.
- As well as telling us their location, studying penguin poo can tell us about penguin diets.
- UK Research and Innovation – through the UK Space Agency and British Antarctic Survey are contributing to our global understanding of our changing planet.



Links for further info:

[Sky at Night Magazine – Penguin Poo](#)

[ESA for Kids – Spotting Penguin Poo from Space](#)

[BAS NEWS – New Emperor Penguin Colony Discovered](#)

[National Geographic YouTube – Penguin Poo From Space](#)

[NASA for Kids – Peeking at Penguin Poop from Space](#)

[Global Ecology and Biogeography - Penguins from space: faecal stains reveal the location of emperor penguin colonies](#)

[BAS – Seal and Penguin Poo is a Major Driver of Antarctic Terrestrial Biodiversity](#)

[New Scientist – Scientists spot new penguin colonies by their poo](#)

[National Geographic – Penguins Facts and Photos](#)

[BAS > Wildlife +-> Penguins](#)

[BAS > Penguins and Climate Change](#)

[BAS > Why Antarctica Matters](#)

[Halley Research Station](#)