

POLAR CAREERS

I am a **geologist**.

I am a **glaciologist**.

I am a **computer modeler**.

Hi, I'm Nick Golledge



Credi: Juliane Golledge

I live in Aotearoa New Zealand, but I'm from the UK. I'm interested in how the Earth works, particularly in how **climate** changes through time and how this affects the way polar **ice sheets** behave.

My first job involved hiking through the Scottish Highlands, making maps of where different **landforms** and **sediments** were. We used that information to **reconstruct** the **glaciers** that

flowed over those mountains during the last **ice age**. (There are no glaciers in Scotland today.)

In my current job, I do the same kind of **ice sheet reconstruction** but using computer **simulations** instead. This means we can investigate how, for example, changes in the temperature of the air or ocean will affect the ice sheets in Antarctica and Greenland, and how melting those ice sheets will lead to **sea-level rise** around the world.

My workday involves setting up new computer simulations or looking at results from ones I just ran. I spend a lot of time **coding**, writing programs to **plot** and analyse the data. For the SWAIS2C project, I run **computer models** that we can compare to the geological data we're collecting. Together, they will help us reconstruct how the ice sheet has changed in the past.



In Antarctica...

On some trips I've spent weeks in the mountains, collecting rock samples or using **seismic techniques** to find out how thick the sediments beneath our feet might be. We do that by hitting a metal plate with a sledgehammer and recording how the sound waves bounce off the layers of rock below.

I've spent weeks on a skidoo driving across glaciers, dragging radar gear behind us to measure how thick the ice is, or installing super-accurate **GPS receivers** to record how fast the ice is flowing.

The best thing about Antarctica is...

I loved the abundant wildlife you see along the **Antarctic Peninsula**. I saw whales and penguins every day, and it was a treat! Something cool is the quiet. There's nothing quite like the experience of standing on a mountain, 100s or 1000s of miles from the nearest research base, and hearing absolutely... NOTHING. It's a very special experience.

Did you know that...

The geographic South Pole is as far south as you can go. But the **magnetic South Pole** is currently located a few hundred kilometres away, off the coast of East Antarctica at only 64 degrees south. This means that when you're using a magnetic compass in Antarctica, you might find that the needle that should be pointing north is actually pointing south!



When I was a kid...

I liked being outdoors, building things, learning to tie all sorts of complicated knots, lighting fires, going camping—that sort of thing. In the photo, I'm driving a miniature coal-powered steam engine that my grandfather built. (My grandparents had a nice long garden, so they built a track from one end to the other!) I always loved getting outside and muddy, so I've been pretty lucky to end up with a job that pays me to do exactly that!

If I weren't a scientist...

I'm not sure what I'd do, but it would be something that involved research—I enjoy finding out how things work. If I could make a living from drawing, playing music, or woodworking, that would be great!

What I do for fun...



Credit: Aitana Forcen-Vazquez

I like:

- trail running
- reading
- playing music
 - bass guitar
 - guitar
 - piano
- and drawing

Becoming a scientist...

I became a scientist a bit by accident, really. I loved learning about the natural world, and when I graduated, I wanted a job working outside. I got a job with the British Geological Survey making maps of the Scottish mountains. In that work, I tried to understand and explain what I was seeing there, so that got me interested in research.

After a few years, I met people who ran computer models that could simulate ice sheets and show how they changed with a changing climate. I found that super interesting, so I got more involved in modelling work.

The biggest challenge in working in Antarctica is...

the weather. It can change all your plans in a very short space of time. Sometimes this means having to completely abandon your fieldwork, even when you know you might never get back to that same location again.

I only take a few things from home (chocolate is a must!), but I usually take things like cuddly toys that my children want to go on an adventure.



At our house, we have alpacas (Typo, Sofia, Mireilla, Luna, and Valentina) and lambs (Nosy, Snuggle, and Indy—short for Indiana Jones, because he's always getting up to mischief). A bit unusual perhaps, but we love having them around!



Find out more about Nick and his work [here](#).

Want to be a scientist?

Nick says:

The most important thing, I think, is to share your enthusiasm and passion for what you're interested in. If it's genuine, people will see it, and opportunities will come.

Glossary

Antarctic Peninsula – the long, narrow stretch of land that sticks out from the main part of Antarctica toward South America and the warmest part of Antarctica

coding – writing instructions (called programs) that a computer can understand and follow

climate – the average, typical temperature and weather patterns over long periods of time

computer models – programs that run on a computer using data, mathematics, and computer instructions to represent how something works or how it might behave under different conditions; a **computer modeler** is a scientist who writes and works with computer models

fieldwork – scientific research, exploration, or observation conducted in “the field”—in this case, Antarctica!—rather than the laboratory or classroom

geologist – a scientist who studies Earth’s physical structure and substance, its history (especially as recorded in rocks), and the processes that act on it

glaciers – massive, thick, slow-moving rivers of ice that flow downhill due to their own weight and the effect of gravity

glaciologist – a scientist who studies glaciers and ice sheets to understand their size, shape, and the way they move and react to their environment

GPS receiver – a device that receives radio signals from GPS satellites and uses them to determine its precise location, time, and speed on Earth

ice age – a time of widespread **glaciation** (the process, condition, or result of being covered by glaciers or ice sheets)

ice sheets – massive blankets of ice over a large area of land. They form over thousands to millions of years as snow falls, compacts, and hardens into ice, and they gradually flow down toward the sea.

landforms – natural features of a land surface, including mountains, plains, valleys, islands, deserts, coasts, canyons, and more

magnetic South Pole – a point on in the Southern Hemisphere where Earth’s magnetic field lines are vertical; its location is not fixed and moves due to changes in Earth’s magnetic field

plot – a graphic representation of data (such as a chart or graph)

reconstruct – to use data and scientific clues and knowledge to understand what happened in the past; **ice sheet reconstruction** explores what ice sheets were like and how they behaved under various conditions in the past

sea-level rise – an increase in the level of the world’s oceans due to the effects of climate change, including thermal expansion of the ocean and melting of ice sheets and mountain glaciers

seismic techniques – methods used to study Earth’s subsurface by analyzing the waves generated by earthquakes or artificial sources, providing information about Earth’s structure, composition, and material properties

simulations – the results of running computer models that show what things might look like or how they might change over time

sediments – material such as rocks, minerals, and the remains of organisms deposited by water, wind, and glaciers

