

Zoë Fleming

Atmospheric chemist

Nina Notman explores the life of a chemist whose bag is always packed



Zoë Fleming has always been fascinated by the natural world. Her desire to better understand the impact humans have on our environment and how to minimise any damage caused has led her around the globe. Highlights include spending a summer doing fieldwork in Antarctica and going to the north pole on board an icebreaker.

Chemistry was one of Zoë's favourite subjects at school, where she particularly enjoyed carrying out experiments. When it came to selecting a degree course, Zoë decided to combine her passion for chemistry and the environment and applied to study environmental chemistry at the University of Edinburgh. 'I chose environmental chemistry as I wanted to use chemistry to try to understand how pollution could be reduced or cleared up,' she explains.

After her degree, Zoë moved to Germany to work at an oceanography research institute. There she researched interactions between the atmosphere and the oceans both in the lab and on field trips. It was during one of these trips to the north pole that Zoë realised she wanted to get her teeth into a longer term, more detailed research project. On returning to dry land, she started applying for PhDs.

A summer in Antarctica

Zoë did her PhD in atmospheric chemistry at the University of Leicester, which involved many field trips to collect data around the UK. After her PhD, she took up a postdoc position at Imperial College London. This job allowed her to spend a summer in Antarctica, measuring the interactions between the ice and the atmosphere.

When this project ended, Zoë did a six month internship with the environmental activist group Greenpeace. Here she helped to track the media presence of various environmental issues and do some background research for future Greenpeace campaigns. 'The skills gained there helped my communication skills and to understand where the science fits in to the broader picture,' she explains. This led to a year assessing the most effective ways to communicate climate change to the public at De Montfort University in Leicester.

A chance spotting of an advert for a postdoc position in her PhD group led to Zoë returning to the University of Leicester in 2007. After a year, she started a more permanent position with the UK's National Centre for Atmospheric Science (NCAS). This centre's staff are scattered across various universities around England, with Zoë remaining in Leicester.

The big picture

As an atmospheric chemist for NCAS, Zoë looks at trends and changes in the air pollutants that can be harmful to humans, plants and ecosystems. These days Zoë has fewer opportunities to go on field trips, instead spending much of her time analysing measurements taken all around the world by her colleagues or automatic measuring stations. 'I spend a lot of time at the computer, number crunching data, plotting graphs, running models and interpreting the data,' she explains. 'I also prepare talks and posters for conferences, write papers for journals and think about what research direction I want to do next. Nowadays I enjoy seeing the big picture of the science rather than being immersed in it in the field so I like to spend my free time in the great outdoors.'

Zoë also spends some of her time teaching and running outreach activities with university students and schoolchildren to inspire a future generation of environmental scientists. Two years ago, Zoë co-lead a scientific expedition for 60 students aged 16–20 to Arctic Norway with the British Exploring Society. There she helped the students take daily air samples, measure the pH of the lakes, rivers and streams they walked past, and assess the amount of dust and dirt particles on the snow.

Taking opportunities

It is the multitude of globetrotting field trips such as this that she credits for her success and recommends others with an interest in environmental chemistry to do the same. 'I always took up opportunities to do as much varied fieldwork as I could, even if it was voluntary and when I was paid least was actually when I did the most exciting things, like going on science cruises or stepping in at the last minute to go all the way to the north pole in an icebreaker. If you appear keen, you are much more likely to be offered a job or given another task to do, which will broaden your experience,' she advises.



Pathway to success

- ▶ **2008–present**
Research scientist, National Centre for Atmospheric Science (NCAS), University of Leicester, UK
- ▶ **2007–2008**
Researcher in atmospheric chemistry, University of Leicester, UK
- ▶ **2007**
Researcher in the communication of climate change, De Montfort University, Leicester, UK
- ▶ **2006**
Media researcher, Greenpeace International, Amsterdam, the Netherlands
- ▶ **2004–2005**
Researcher in Antarctic chemistry, Imperial College London, UK
- ▶ **2001–2004**
PhD in atmospheric chemistry, University of Leicester, UK
- ▶ **2000–2001**
Marine chemist, Leibniz Institute for Baltic Sea Research, Warnemünde, Germany
- ▶ **1996–2000**
MChem in environmental chemistry, University of Edinburgh, UK
- ▶ **1995**
European Baccalaureate (specialising in chemistry, biology, maths and experimental chemistry), European School of Brussels, Belgium

Exploring Arctic Norway

Read about Zoë's trip to Arctic Norway with 60 young explorers:
<http://rsc.li/1kxrh5D>