Name: Emily Connolly

Place of work: Department for Environment, Food and Rural Affairs (Defra)

Position: Senior Scientific Policy Advisor

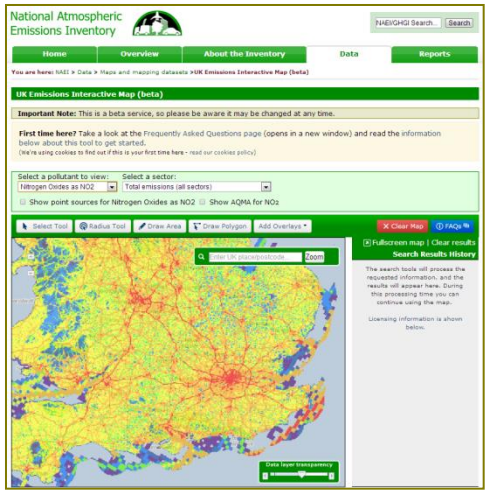
Job Description:

My work involves managing, communicating and interpreting scientific air pollution data for policy makers. My job also involves publishing and sharing of data with the public through multiple forms of media to meet legal requirements and user needs.

How do you make use of Quantitative Methods in your everyday work?

I work at the science-policy interface, interpreting scientific data and information for policy makers. Air quality data comes in to me in all sorts of different formats; maps, spreadsheets and online. My job is to analyse the data and to help answer the policy relevant questions.

For example, the data I am working with might be official statistics or I may be compiling the UK report on air quality for the EU. In this situation, I have to make sure the data complies with the EU regulations on statistical calculations and is handled and published correctly. I also use GIS skills to map data, enabling data visualisation and spatial analysis of data sets as well.



To understand air quality, I also look at trends over time. Key to any type of policy development and work in civil service for central government is doing impact assessments for new policies. I work alongside economists that put together scientific and economic evidence to show the cost benefit analysis of any particular new policy.

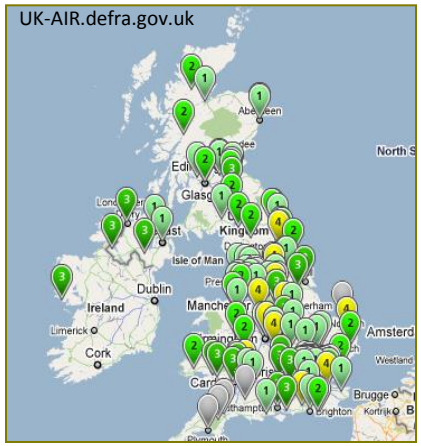
"Data literacy is a key skill in producing impact assessments for policy for government"

"We improved the resolution of the air pollution forecasts to give much greater focus on London through the Olympics"

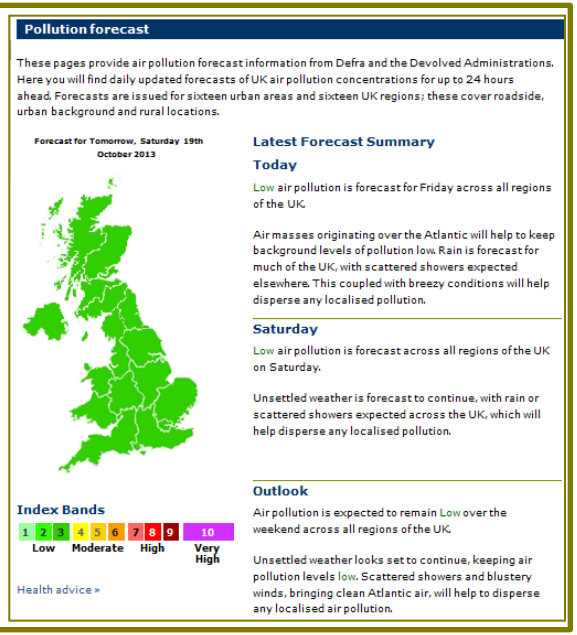
Air quality and the London Olympics

The London Olympics really brought a focus onto London and environment, the athletes and the many visitors. Our job was to understand the air quality and make sure anyone visiting the city would have access to information about London's air quality on a daily basis. We also provided daily information to the people travelling around the country with the Olympic torch. Essentially what that means is we provided daily air pollution forecasts for the public so that they could understand and know in advance, just like with weather, what the pollution will be like the next day. Defra published the air pollution data together with health advice on our website and twitter feed @DefraUKAIR. We also have a freephone and email bulletin service so that wherever people are they can get access to this data. The health advice that goes with the pollution forecasts is split into advice for the general public and for people who may be at greater risk of the effects of air quality e.g. people with underlying cardiovascular problems, or adults with heart and lung problems. The advice together with the pollution levels enable people to change their behaviour according to the pollution forecasts. We changed the resolution of the forecasts to give much greater focus on London through the Olympics. We also made sure that the measurement data we had were at the highest possible resolution so that you could see hour by hour how pollution levels were changing. We worked with the Met Office, the Environment Agency and Public Health England. We provided daily briefings to ministers and to the London Olympic Organising Committee so that everyone involved could see whether or not they were likely to experience air pollution problems.

Photo source: Jon Osbourne, Flickr



A national network of 150 air pollution monitoring stations for Defra gives readings every 15 minutes.
Defra also has daily air quality forecasts produced from models, to tell us what pollution will be like the next day.



Do you build upon work produced using the quantitative skills of others?

Yes, a lot of the detailed research and services I manage is carried out by academics and expert consultants. I also work with other government departments for example, the Department for Transport and the Department of Energy and Climate Change. It is important that government works collaboratively and in partnership with other data providers to ensure value for money. Budgets are decreasing but we still have a job to do to provide robust scientific information.

"I love working with information and communication and data literacy has been central for this"

What would your advice be for people who have an interest in joining the environment sector after their studies?

Having a physical science degree gave me excellent analytical skills and a high level of numeracy which I knew I could apply in a range of fields, from science, business, law, education to finance. I began developing specialist modelling and measurement skills in air pollution management which have been central to my development as an environmental scientist.
Quantitative skills are essential for a science or evidence career in the civil service and for work in environmental consultancy. Policy must be based on sound evidence and data, quantitative skills are needed to collect, manage, analyse, and communicate these data and information to develop robust policy.

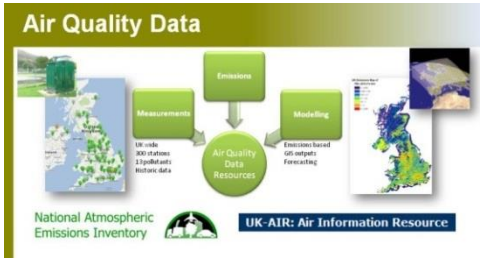
Hack day

A hack day is when people from the environmental or geo-community come together with "hackers" and people who are skilled in manipulating data and programming (the tech guys!). We pitch ideas about the kind of products, applications or websites that might help solve a particular policy issue. The hackers then choose who they want to work with. In a recent hack day, I (on behalf of Defra) pitched an idea about a UK journey planner using Defra's modelled pollution data to suggest to cyclists and walkers the route from A to B that would have the lower amounts of pollution compared with other routes. Working collaboratively, I gave the hacker community an understanding of the policy issue and the data available so they can then use their skills to produce something really useful for society and for the public.

How do you maintain and develop your Quantitative Methods skills? How important is this continued learning for your on-going career?

Training and on the job learning are the best ways to maintain quantitative skills. I have taken GIS training courses, attended technical conferences and am a Chartered Environmentalist. Networking is important and I have attended hack days, talks at the Open Data Institute and I am involved in collaborations like the UK Environmental Observation Framework. I sit on the committee for the Institute of Air Quality Management and have joined groups such as Women in Data. This has provided me with an extended network outside of Government and a wider data community. As my career has developed I have done less of the hands on information management, but an ability to understand and use it is no less important, and developing a vision and strategy for it is increasingly important.

"Air pollution, like other environmental issues, does not respect borders. Sharing data in standardised formats is becoming increasingly important for policy makers at local, national and EU level".



What does the future hold?

Monitored and modelled pollution levels and emissions data are the pillars of the evidence base. The next steps are to create EU wide, standardised, inter-operable datasets . These are requirements of the EU INSPIRE Directive which will provide many technical challenges but exciting policy opportunities in the next decade. Advances in citizen science, open data and sensor technologies will also change the way data are viewed and used by the public and policy makers to benefit society.

To find out more about where Quantitative Methods can take you, visit the following:

RGS-IBG website: Royal Geographical Society with IBG www.rgs.org