

5.030 The importance of different global change processes for future air quality.

Early Career Scientist

Presenting Author:

Suzanne VAN ZUIJLEN, Lancaster Environment Center, Lancaster, United Kingdom, vanzuijlen.suzanne@gmail.com

Co-Authors:

Paul YOUNG, Lancaster Environment Center

Oliver WILD, Lancaster Environment Center

Rob LAMB, JBA Trust

Rachel BRISLEY, JBA Consulting

Fernando IGLESIAS-SUAREZ, CSIC

Abstract:

Poor air quality is a global threat to human and ecosystem health and crop yield. Over 3.5m deaths each year result from air pollution and between 2005 and 2010 the global death rate from this threat increased by 5%. Moreover, air quality (AQ) pollutants are also climate forcing agents and therefore contribute to climate change.

Understanding the future trajectory of AQ depends not only on projecting AQ pollutant emissions, but also on how climatic and meteorological factors will change. Factors such as the future occurrence of heatwaves and stagnation events, the passage of fronts, and the input of ozone from the stratosphere will likely change, linked with changes in the global atmospheric circulation patterns. These are expected to affect the occurrence, strength and length of polluted events.

We will present the results from a set of global chemistry climate model simulations. We explored and quantified the change in the risk of AQ extreme events, isolating different drivers of AQ change: climate change based on different scenarios, anthropogenic emission changes, and stratospheric ozone recovery. This is to better understand the links and impacts on AQ from climate change, and to understand which processes are the most important for given locations/given times of the year.

This project is in collaboration with the JBA Trust and its main sponsor, who have expertise in communicating with decision makers about future climate risk, particularly relating to flooding and also health issues. The goal of this research is to use JBA's expertise to deliver information on future AQ in a formal risk framework, such that it can be more readily used by decision makers in their policy planning (e.g., mayors of large cities).