



## Climate Response to Short-lived Pollutants (CReSP)

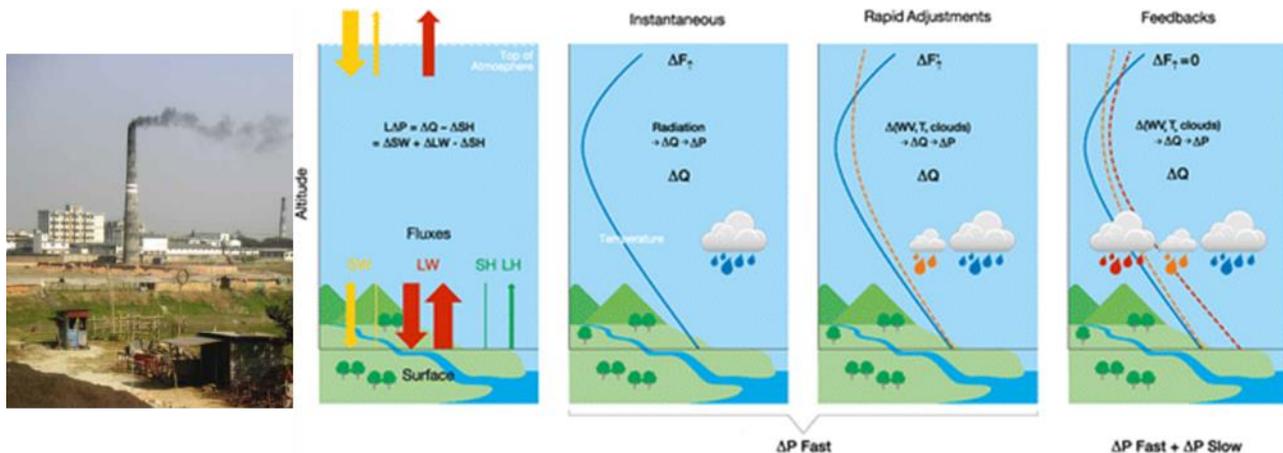
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This project is to investigate the impacts of air pollutants on climate. As well as causing health problems, air pollutants such as ozone, soot and sulphuric acid also affect climate by changing the Earth's radiation balance. They can either warm climate by absorbing radiation or cool by scattering it. Levels of pollution are expected to decrease in future as countries pass stricter laws on air quality. But will this be good or bad for climate change? Do the effects differ depending in which countries the pollution is reduced? Reducing soot has been advocated as a way to limit short-term climate change, but ongoing research is starting to suggest it might not be as effective as first thought because it changes the way atmospheric temperatures decrease with height. These are still unresolved questions in climate science and need to be answered.

In this project you will use a range of tools from the UK's state of the art Earth System model (incorporating an extensive range of physical, chemical and biogeochemical process to describe the world), to a specialized radiative transfer model. You will investigate how altering levels of pollution affects the radiative balance and can cause rapid changes in clouds, temperatures etc. You will research how these rapid meteorological changes determine the overall effects on the Earth's climate over the next few decades. This will lead to new understanding of how air quality pollutants affect climate and thus the consequences of different air quality policies.



Schematic illustration of how rapid adjustments affect the radiative balance of the climate. Myhre et al. Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-16-0019.1, 2016.

### Training opportunities:

In Reading you will be part of the Radiation group in the Department of Meteorology interacting with researchers in radiation, chemistry and aerosols. You will spend at least 3 months at the Met Office in Exeter within the Earth System and Mitigation Science team, relating your work to wider climate science and

understanding how this science is used by the UK Government. Training courses will be provided on running climate models on large supercomputers.

This is a new and rapidly increasing area of climate science and will involve you collaborating with international scientists in the field.

**Student profile:**

This project would be suitable for students with a degree in physics, mathematics or a closely related environmental or physical science. It would suit a student with an interest in environmental issues like air pollution and climate change.

Experience of computing and some prior knowledge of programming in python or similar would be desirable, but is not essential as training will be provided.

**Funding particulars:**

This is a CASE studentship in association with the Met Office.

<http://www.reading.ac.uk/nercdtp>