

What have we learned about climate from lockdown?

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The impact of particles of pollution on climate is a major uncertainty in our understanding of the Earth system. That uncertainty hinders our ability to answer many crucial questions about climate change, including: What were the causes of past climate changes? How much more carbon can human civilisation emit without risking exceeding 1.5 or 2°C of warming? Can we cool the climate through geo-engineering?

The climate impacts of pollution particles are uncertain because of those particles interact with sunlight and are involved in the formation of clouds through many complex mechanisms. Disentangling those interactions from the influence of changes in weather is a difficult challenge. In addition, natural processes also emit particles into the atmosphere, often dampening man-made impacts in ways that are only partly understood. In that context, the national lockdowns that followed the Covid19 pandemic provided an unexpected and unrivalled opportunity to observe a more pristine world.

This talk will first summarise how pollution affects our climate and identify the most pressing open questions. We will then review recent findings made possible by Covid lockdowns, ranging from the impact of pollution on reflected sunlight to the impact of aviation on ice clouds and the quantification of long-range transport of pollution.