

'Asian haze' impacts on Australian rainfall

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Elevated particle emissions resulting from increased economic activity in Asia may have increased Australia's tropical rainfall, according to new research on the way pollution influences our climate.

"Until now, there has been ample evidence that these particles have important effects on climate in the Northern Hemisphere but little such evidence in the Southern Hemisphere," says CSIRO Marine and Atmospheric Research scientist, Dr Leon Rotstayn.

"What we have seen in our latest climate simulations is that the 'Asian haze' is having an effect on the Australian hydrological cycle and generated increasing rainfall and cloudiness since 1950, especially over northwest and central Australia. The effect occurs because the haze cools the Asian continent and nearby oceans, and thereby alters the delicate balance of temperature and winds between Asia and Australia. It has nothing to do with Asian pollution being transported directly over Australia."

Dr Rotstayn says this implies that decreasing pollution in Asia later this century could reverse this effect and lead to an increase in Australian drying trends.

"We are really at the beginning of understanding the trends but sooner or later these emissions will be cleaned up and then a trend of increasing rainfall in the northwest and centre could be reversed. This is potentially serious, because the northwest and centre are the only parts of Australia where rainfall has been increasing in recent decades."

Dr Rotstayn stresses that climate modelling is a valuable tool for teasing out what is actually causing weather trends, rather than simply assuming that these trends are all related to greenhouse gases.

At a time when Australian science agencies are investing in new climate forecasting capabilities, the research – to be published early in 2007 in the Journal of Geophysical Research – increases confidence in the accuracy of future climate simulations for Australia.

An aerosol is a haze of particles in the atmosphere. Dr Rotstayn says representing aerosols in climate models and understanding their influence on cloud formation and rainfall is one of the biggest challenges facing climate scientists.

"Because the cooling effect of aerosol pollution is possibly comparable to the warming effect of increased levels of carbon dioxide, the message from this research is that aerosols are an essential inclusion if we are to accurately describe present and future Australian climate," he says.

The new research is based on simulations performed with a new low-resolution version of CSIRO's global climate model – including a treatment of aerosols from both natural and human-induced sources.

Source: CSIRO Australia

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