



## **Impacts of East Asian aerosols on the Asian monsoon**

Rachel Bartlett (1), Massimo Bollasina (1), Ben Booth (2), Nick Dunstone (2), and Franco Marengo (2)

(1) School of Geosciences, University of Edinburgh, Edinburgh, United Kingdom, (2) Met Office Hadley Center, Exeter, United Kingdom

Over recent decades, aerosol emissions from Asia have increased rapidly. Aerosols are able to alter radiative forcing and regional hydroclimate through direct and indirect effects. Large emissions within the geographical region of the Asian monsoon have been found to impact upon this vital system and have been linked to observed drying trends. The interconnected nature of smaller regional monsoon components (e.g. the Indian monsoon and East Asian monsoon) presents the possibility that aerosol sources could have far-reaching impacts. Future aerosol emissions are uncertain and may continue to dominate regional impacts on the Asian monsoon. Standard IPCC future emissions scenarios do not take a broad sample of possible aerosol pathways. We investigate the sensitivity of the Asian monsoon to East Asian aerosol emissions. Experiments carried out with HadGEM2-ES use three time-evolving future anthropogenic aerosol emissions scenarios with similar time-evolving greenhouse gases. We find a wetter summer over southern China and the Indochina Peninsula associated with increased sulfate aerosol over China. The southern-flood-northern-drought pattern seen in observations is reflected in these results. India is found to be drier in the summer overall, although wetter in June. These precipitation changes are linked to the increase in sulfate through the alteration of large scale dynamics. Sub-seasonal changes are also seen, with an earlier withdrawal of the monsoon over East Asia.