

“History of the Asian Monsoon”

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The Asian monsoon is the most gigantic monsoon system in the world, and plays a critical role in the global climate system. The monsoon rains are vital for the livelihood of about 2/3 of world population living in the Indian subcontinent, Southeast Asia and eastern China. The wax and wane of the Asian monsoon however can disturb the region with severe flooding and droughts, and can cause persistent challenges to the limited water resources and food security in Singapore.

In this talk, I will explain the origins of the Asian Monsoon and fundamental mechanisms of monsoon variability that can be linked to tectonic movements, the Earth evolving orbit, and ocean-atmosphere circulations elsewhere in the world. I will show in examples how we use stable and radiogenic isotopes in cave carbonate deposits to study past monsoon changes, in particular during the two recent time windows, the past 20,000 years and the past 2,000 years, respectively. The potential response of the Asian monsoon to anthropogenic forcing will also be introduced.