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SEMINAR TITLE:

Dr. Zhiping Tian

Date:	Wednesday, October 26, 2016
Refreshments:	3:00pm at MSB courtyard Free Cookies, Coffee & Tea Provided (Please Bring Your Own Cup)
Seminar Time:	3:30pm
Location:	Marine Sciences Building, MSB 100

Abstract:

Monsoons are a major component of tropical and subtropical circulation and play an important role in the global energy and water cycle. Because monsoons are a global phenomenon in essence, and variations of monsoonal circulations have great impacts on those of the tropical Pacific Walker circulation (PWC), understanding the changes in global monsoon (GM) and tropical PWC is therefore of broad scientific and socio-economic interest. Since GM and tropical PWC both oscillate with different mechanisms on orbital-to-decadal time scales, it is of importance to look back into the past for a better assessment of the twenty-first century GM and PWC.

Paleoclimate modelling provides an opportunity to test the model sensitivity in response to external orbital forcing. The mid-Holocene, approximately 6,000 years before present, is an ideal time period for such a study to understand past climate change on the orbital scale.

Based on the above, we present an analysis of the mid-Holocene GM and tropical PWC from the perspective of multiple climate models under the protocol of PMIP simulations. Results show that compared to the reference period, both the mid-Holocene GM area and GM precipitation increased in the majority of the models, which were mainly due to the increase over the boreal land and austral ocean; and the GM precipitation intensity decreased in most models mainly due to the decrease over the boreal ocean and austral land. Orbital-induced changes in large-scale meridional temperature gradient and land–sea thermal contrast are the underlying mechanism. The annual mean of the PWC intensity strengthened, and both the western edge and center of the PWC cell shifted westward in the majority of the models used for analysis during the mid-Holocene, which are mainly attributed to the changes in boreal warm seasons. The change in the monsoon rainfall and associated large-scale east–west circulation, rather than the equatorial Pacific SST change pattern, played a key role in affecting the mid-Holocene PWC strength.