

Tropical pacific and its global impacts

Jianping Li

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This special issue of *Theoretical and Applied Climatology* is devoted to the tropical Pacific and its global impacts on climate processes. While it is widely accepted that the western tropical Pacific warm pool plays an important role in our climate system and for the El Niño–Southern Oscillation (ENSO), little is known about the detailed dynamical processes that establish the meridional transport of heat and mass during ENSO events. This lack of in-depth understanding inspired the Climate Variability and Predictability (CLIVAR) Pacific panel to organize an international workshop on Western Tropical Pacific: Hatchery for ENSO and Global Teleconnections in Guangzhou, China, from 26 to 28 November 2007, which was generously funded by the Chinese Academy of Sciences (CAS), the National Natural Science Foundation of China, Guangzhou Association for Science and Technology, the South China Sea Institute of Oceanology/CAS, the First Institute of Oceanography/State Oceanic Administration People's Republic of China (PRC), the Second Institute of Oceanography/State Oceanic Administration PRC, the AIPO973 Program (Ocean–Atmosphere Interaction over the Joining Area of Asia and Indian–Pacific Ocean and Its Impact on the Short-Term Climate Variation in China), World Climate Research Program, and US CLIVAR. All seven papers presented here were part of workshop.

The workshop attracted about 80 scientists from 11 countries. The topics being discussed during the workshop

include: the effects of the South China Sea on regional and large-scale climate, review of ongoing observational activities in the eastern equatorial Pacific and North Pacific, the interactions among the Madden-Julian Oscillation (MJO), ENSO, westerly wind bursts (WWB), and the mean state, long-term ENSO changes, predictability of ENSO, and the improvements in ENSO predictions and how ENSO predictions are actually used by societies.

Important recommendations that were derived from this workshop include:

- The role of South China Sea sea surface temperature anomalies for the atmospheric circulation needs to be studied using higher-resolution coupled general circulation models and appropriate partial coupling techniques.
- Improving the representation of MJO–WWB–ENSO interactions in coupled general circulation models is an important step towards increasing ENSO forecast skill.
- Scientific coordination of VAMOS Ocean–Cloud–Atmosphere–Land Study and the Southwest Pacific Ocean Circulation and Climate Experiment (SPICE) might prove useful to elucidate some key aspects of the dynamics of the South Pacific Convergence Zone.
- Coordination of the Northwestern Pacific Ocean Circulation Experiment, SPICE, and Pacific Source Water Investigation will help to elucidate the fundamental role of low-latitude western boundary currents for the ENSO recharging and discharging process.

The CLIVAR Pacific panel meeting that followed the workshop also discussed how to achieve a comprehensive view of low-latitude boundary currents in both hemispheres and the Indonesian Throughflow (ITF) as well as their roles in the climate system.

The seven papers are only a partial collection of all contributions to the workshop; however, they cover a wide

J. Li (✉)

State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics (LASG),
Institute of Atmospheric Physics (IAP),
Chinese Academy of Sciences (CAS),
P.O. Box 9804, Beijing 100029, China
e-mail: ljp@lasg.iap.ac.cn

range of issues related to tropical Pacific and its impacts. One paper focuses on the linkage between the tropical Pacific Ocean and the tropical Indian Ocean, two on the South China Sea and its relation with ENSO, one on ENSO prediction, one on interannual horizontal heat advection in the surface mixed layer over the equatorial Pacific Ocean, one on interdecadal changes in the nonlinearity of ENSO, and one on the relationship of the ITF with the Indian Ocean Dipole.

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