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(February 4th 2024)

Affiliation

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Education

- Ph. D. (1984), Geophysical Fluid Dynamics, Florida State University.
- M. S. (1981), Meteorology, University of Science and Technology of China, Beijing.
- B. S. (Equivalent) (1966), Physical Oceanography, Ocean University of China.

Professional Experience

- 01/2021-Present Prof. Emeritus, UH
- 07/2010-01/2014: Chair of Department of Meteorology
- 01/99 - Present: Co-Leader for IPRC Asian-Australian Monsoon Theme
- 03/2014 - Present: Director of Earth System Modeling Center (ESMC), Nanjing University of Information Science and Technology, Nanjing, China.
- 10/2014- 9/2019: Director of China-US Atmosphere-Ocean Research Center
- 07/92 – 12/2020: Professor, Meteorology, University of Hawaii.
- 01/88 – 12/2020: Senior Fellow, JIMAR, NOAA/UH
- 07/89 - 06/92: Associate professor, Meteorology, University of Hawaii.
- 01/87- 06/89: Assistant Professor, Meteorology, University of Hawaii.
- 11/84 - 12/86: Visiting Scientist, GFDP, Princeton University.
- 08/84 - 11/84: Research Associate, GFDI, Florida State University.
- 05/81 - 08/84: Research Assistant, Meteorology and GFDI, Florida State University.
- 09/78-04/81: Research Assistant, Institute of Atmospheric Physics, Chinese Academy of Sciences.
- 02/68-08/78: Meteorologists, Chinese Meteorological Administration/Shangdong Province

I. AWARDS AND RECOGNITION

I-1 Awards

- 2015 Received the Carl-Gustaf Rossby Research Medal, the highest award from American Meteorological Society, in 2015 “for creative insights leading to important

advances in the understanding of tropical and monsoonal processes and their predictability".

- 2015 Received the "You bring charm to the world as most influential Chinese 2014-2015" Award.
- 2013: Elected *Fellow, American Geophysical Union.*
- 2013: University of Hawaii "Board of Regent's Medal for Excellence in Research" Award.
- 2012: "Scientist of the Year" Award 2011-2012 ARCS (Achievement Awards for College Scientists) foundation, Honolulu Chapter.
- 2011: Ministry of Education, Science and Technology of Republic Korea, Foreign PI of "Global Research Laboratory" on Global Monsoon Climate Change, 2011-2017.
- 2010: National Aerodynamics and Space Administration (NASA) Group Achievement Award to Genesis and Rapid Intensification Processes (GRIP) Bin Wang.
- 2009: Elected *Fellow, American Meteorological Society.*
- 2004: Visiting Professorship Award, Center of Excellence for Earth-Sun Relation Research, Nagoya University, Japan 2004
- 2000: Visiting Scholar Award, Foundation for the Advancement of Outstanding Scholarship, Chaired by Dr. Yuan-Tseh Lee Nobel Laureate.
- 2001: Visiting Professorship, Center for Climate System Research, University of Tokyo.
- 2000: Visiting Professorship, City University of Hong Kong.
- 1994: Visiting Scientist Fellowship, Max-Planck Institute for Meteorology, Hamburg.
- 1993: Visiting Professorship, National Meteorological Center/Climate Prediction Center

I-2 Major International/National Boards and Committees

- 2016-2022, member, International Science Advisory Panel, Centre for Climate Research Singapore (CSRS). Singapore.
- 2015-present, member, Science Review Panel, UK-China CSSP.
- 2012-2017, Co-Chair, Science Advisory Committee, Asian Pacific Economic Cooperation (APEC) Climate Center.
- 2010-2015, Chair, Advisory Board, Research Center for Environmental Changes (RCEC), Academia Sinica. Taiwan.
- 2007-2012, Co-Chair, Science Steering Committee, WCRP/CLIVAR-GEWEX Asian Monsoon Years (2007-2012).
- 2007-Present, Co-Chair, Advisory Committee, WMO (World Meteorological Organization)/ WWRP/TMR Monsoon Panel's Expert Team on Climate Impacts on Monsoon Weather.
- 2007-2014, Co-Chair, IGBP/PAGES Working Group on Global Monsoon and Low Latitude Dynamics
- 2015-present, Member, International Science Advisory Committee, Center for Climate Research Singapore.

- 2009-2013, Member, WCRP (World Climate Research Program)/ CLIVAR Asian-Australian Monsoon Panel (AAMP).
- 2011-Presint: Science Advisory Committee member, College of Global Change and Earth System Science, Beijing Normal University.
- 2006-2014, Science Advisory Committee member, Center for Ocean-Land-Atmosphere Science, USA
- 2006-2014: Science Advisors to National Climate Center of Chinese Meteorological Administration.
- 2003-Present: Science Advisor to Central Weather Bureau, Taiwan.

- 2005-2009, Co-Chair, WCRP (World Climate Research Program)/ CLIVAR Asian-Australian Monsoon Panel (AAMP).
- 2008-2010, National Research Council (NRC), Member, Committee on Assessment of Intraseasonal to Interannual Climate Prediction and Predictability.
- 2007-2009, WCRP/WWRP/YOTC (Year of Tropical Convection), Member, Science Steering Committee.
- 2004-2008, WCRP/CLIVAR Science Steering Group Member.
- 2001-2010, Co-Chair, Academic Committee, National Key Laboratory for Atmospheric Science and Geophysical Fluid Dynamics, Chinese Academy of Sciences.
- 2004-2006, START/ MAIRS (Monsoon Asia Integrated Regional Study), member, Science Steering Committee,
- 2000-2005, American Meteorological Society (AMS)/Committee on Interaction of the Sea and Atmosphere, Member.

I-3 Keynote /Distinguished lectures

- 2023: Third Distinguished Ogura Lecture, Meteorological Society of Japan, Global Monsoon: Concept and Response to External Forcing and Internal Feedbacks, Sendai, Japan, Oct 23-25, 2023.
- 2023: Joint WCRP-WWRP Webinar Series, Global Monsoon Response to External Forcing and Internal Feedbacks, September 13, 2023.
- 2023: The Climate, Weather and Water Forum (CW2F) 2023, Dynamics of Clustered Extreme Weather and Climate Events, 3-5 June 2023, HKUST, Hong Kong.
- 2022: Seventh WMO International Workshop on Monsoons (IWM-7), Climate Change and Monsoon, 22-26 March 2022, New Delhi, India
- 2021: IAMES Forum, Global Monsoon Response to External Forcing and Internal Feedbacks, 4-29-2021. Nanjing, China. Online.
- 2021: Indian Institute of Science, Center for Atmospheric and Oceanic Sciences, Decadal Prediction of Land Monsoon Rainfall, 1-9-2021. Online.
- 2020: Plenary talk at Institute of Atmospheric Physics, LASG 35 anniversary symposium. Dynamic perception of El Niño diversity and future change of extreme El Niño 12-24 2020, online.
- 2020: Nordenskjöld Lecture, University of Gothenburg, Sweden, Global monsoon change under global warming, September 18, 2020, online.
- 2018: Plenary talk at Qingdao National Laboratory of Marine Science and Technology, Annual symposium. Qingdao, China, January 12-14, 2018.

- 2017: Keynote, IODP-PAGES Workshop on Global Monsoon in Long-term Records, Shanghai, China, 7-9 September 2017
- 2017: Keynote, 10th WESTPAC International Scientific Conference, entitled "Advancing Ocean Knowledge, Fostering Sustainable Development: from the Indo-Pacific to the Globe." Qingdao, China, 17-20 April 2017
- 2016: Distinguished Lecture, 13th Annual meeting Asia-Oceania Geoscience Society, July 31-Aug 5 2016, Beijing.
- 2016: Keynote, third Earth System Science Conference (ESSC), July 4-6, 2016 Shanghai, China.
- 2016: Keynote Lecture, 2016 Taiwan Geoscience Assembly, May 16-20, 2016, Taipei, Taiwan.
- 2013: Plenary talk on COAA international conference, Hong Kong 8-19 to 22 2013.
- 2012: Keynote, Korean National Academy of Science, 39th international symposium, Oct 19th 2012, Seoul, Republic of Korea.
- 2012: Keynote, Eighth Session of the Forum on Regional Climate Monitoring, Assessment and Prediction for Asia (FOCRAII), 5-7 April 2012, Beijing China.
- 2011: Keynote, APEC Climate Symposium, Sept. 16-19 2011, Honolulu, Hawaii. USA.
- 2009: Keynote, First International Conference on Policy & Research for Global Disaster Management, National Emergency Management Agency, Korea. Nov 11-13 2009. Seoul.
- 2009: Distinguished Lectures, "Beijing Summer School for Atmosphere, Climate and Environment: Climate Dynamics and Physics", August 10-18 2009, Peking University.
- 2009: Keynote, International Frontier Research Forum on Atmospheric Sciences, April 18-19 2009 Nanjing University, Nanjing. China.
- 2008: Keynote lecture, Conference on Teleconnection in the Atmosphere and Ocean, 17 - 20 November 2008, International Center for Theoretical Physics (ICTP) Trieste, Italy.
- 2008: Keynote, WMO Fourth International Workshop on Monsoons (IWM-IV), 20-25 October 2008, Beijing.
- 2008: Keynote, International Workshop on Anthropogenic Impacts on Asian Monsoon, MAIRS, April 21-23, 2008, Nanjing.
- 2007: Keynote, 3dAlexander von Humboldt International Conference on The East Asian Summer Monsoon: Past, present and future, 27-31 August 2007, Beijing.
- 2007: Keynote, International Conference on "Celebrating the Monsoon", June 24-27 2007, Bangalore, India.
- 2007: Key note, Pacific Science Congress/ Symposium on Global Change, Asian Monsoon, and Extreme Weather and Climate, 11-12 June 2007, Taipei.
- 2006: Keynote lecture, International Center for Theoretical Physics, Workshop on Seasonal Climate Prediction August 7-18 2006, Trieste.
- 2006: Keynote lecture, First ECCE summer school of advanced study in climate and environment: Modeling of the Climate System, July 30-August 12, 2006, Beijing.
- 2006: Keynote, WMO/Winter MONEX: A Quarter Century and Beyond, April 4-7 2006, Kuala Lumpur.
- 2006: Keynote lecture, International Center for Theoretical Physics Workshop on Tropical Convection and MJO, March 14-18 2006, Trieste, Italy, (Fundamental processes of the Madden-Julian Oscillation).
- 2005: Keynote, International Symposium on Active Geosphere, November 8-11, 2005, Wuhan, China.

- 2001: Keynote, Asian Monsoons and Global Linkages on Milankovitch and sub-Milankovitch Time Scales. Beijing, May 9-14, 2001.
- 2000: Keynote, International Conference on Ocean and Atmosphere, June 2000, Taipei, Taiwan.
- 1998: Keynote lecture, WMO Commission for Atmospheric Sciences XII session, Skopje, Macedonia.

I-4 Guest Professorship

- 2015-2018: Distinguished Chair Professor, National Taiwan University.
- 2013-present: Director, Earth System Modeling Center, Nanjing University of Information Science and Technology.
- 2011-2017: Oversea Dean and Guest Professor, College of Atmospheric Science, Nanjing University of Information Science and Technology.
- 2001-2010: Guest Professor, Institute of Atmospheric Physics, Chinese Academy of Science.
- 2008-2011: Guest Professor, Peking University.
- 2005-2009: Leader Professor, Ocean University of China/ College of Physical Oceanography and Marine Environment.
- 1992-2001: Guest Professor, Chinese Academy of Meteorological Sciences
- 2002-2008: Guest Professor, National Climate Center of China

II. RESEARCH

II-1 Areas of Expertise

General Fields: Climate Dynamics, Dynamic Meteorology, Tropical Meteorology, Atmospheric Sciences, Geophysical Fluid Dynamics, Physical Oceanography.

Specific areas: Monsoons, Tropical Intraseasonal Oscillation, El Nino-Southern Oscillation (ENSO), Climate Variability, Predictability, and Prediction, Climate Changes, Tropical Cyclones, Atmosphere-Ocean Interaction, Atmospheric Waves and Instability.

Research approaches involve theoretical analysis, numerical modeling, and observational analyses. Research efforts focus on understanding of the fundamental physics governing variations of weather and climate.

II-2 Citation (Google scholar December, 2023)

H-index: 136; Total citation: 67,000

II-3 Major contribution to Atmospheric and Climate Dynamics

Wang and collaborators have advanced our understanding of the fundamental processes and predictability of tropical climate and global monsoon through advances in theory, numerical experimentation, diagnostic analysis, and climate prediction. The significant research accomplishments are highlighted below.

a. Monsoon dynamics and predictability

Wang et al. (2000) advanced *an atmosphere-ocean interaction theory* to explain El Nino-Southern Oscillation (ENSO)-East Asian Monsoon teleconnection. The theory elucidates how the positive thermodynamic feedback between moist atmospheric Rossby waves and underlying SST anomaly extends ENSO's impacts to upstream midlatitude during ENSO decaying phase, affecting East Asian monsoon.

Wang and collaborators established the monsoon-ocean feedback as an essential process to climate predictability, reshaping the conventional perception on the physical basis for monsoon prediction. Wang et al. (2004) discovered that treating monsoon as a slave to SST forcing results in the failure of the atmospheric general circulation models (AGCMs) in reproducing summer monsoon rainfall, pointing to a strategic weakness of the AMIP (Atmospheric Model Intercomparison Project), and the two-tier approach (predict monsoon anomalies with AGCM forced by predicted SST) for *monsoon* prediction, as well as reanalysis using atmospheric models alone. With observed data and multi-model seasonal hindcast experiments, Wang et al. (2005) further demonstrate the necessity for using coupled models for summer monsoon prediction, shifting the paradigm of the "boundary-forced predictability" to "coupled monsoon-ocean predictability".

Wang and collaborators disclosed that the positive monsoon-warm ocean feedback and the annual variations of the monsoon mean states are two critical factors that control the interannual variability of the Asian-Australian monsoon system in addition to ENSO (Wang et al. 2003).

Wang and collaborators first suggested the notion that the Asian monsoon is driven by two relatively independent heat sources over the Bay of Bengal and the Philippine Sea, respectively (Wang and Fan, 1999), which leads to distinct climatology and interannual variations of the South Asian and East Asian summer monsoons (Wang et al. 2001) and unique features of East Asian monsoon variability (Wang et al. 2008a, b).

b. Conceptual development of global monsoon

Monsoon has been traditionally defined by annual reversal of prevailing surface winds in the past three centuries. A hydrometeorological definition of monsoon was first proposed by Wang (1994) based on the contrasting rainy summer and dry winter of the monsoon characteristics. This new definition extends the monsoon domains from the eastern hemisphere to the western hemisphere and from land to ocean. This conceptual development leads to the pioneering works that delineate the Asian monsoon rainy season (Wang and LinHo 2002), the global monsoon domain (Wang and Ding 2008), and variability (Wang and Ding 2006).

Wang and collaborators revealed the mechanisms driven interannual, multidecadal and centennial variability of the global monsoon (e.g., Wang et al. 2013a), discovered that divergent changes of the global precipitation to solar-volcanic and greenhouses gas forcing, which enlightens fundamental processes governing the climate change of hydrological cycle and global monsoon (Liu et al. 2013) and pioneered decadal prediction of Northern Hemispheric land monsoon rainfall (Wang et al. 2018).

Wang et al. (2020) enriched the understanding of Global monsoon change and first proposed that dynamic effects determined regional monsoon change in the future. Two thermodynamic effects of GHG forcing, the increasing moisture and atmospheric stability, offset each other, resulting in a moderate increase in global monsoon precipitation. Wang and the

world's prominent monsoon specialists reviewed "monsoons in climate change" (Wang et al. 2021).

c. Tropical Intraseasonal Oscillation

Madden-Julian Oscillation **(**MJO) is a dominant mode of tropical intraseasonal climate variability and the cornerstone for subseasonal prediction on a 2-8 week time scale. We have pioneered the development of an understanding of the essential dynamics of MJO and active-break cycles of the monsoons.

He and his student revealed, for the first time, season-dependent 2-dimensional propagation pathway and 3-D circulation structures of the MJO convective anomalies and circulation systems (Wang and Rui 1990a**;** Rui and Wang 1990a)**.**

Wang and his student advanced one of the earliest theories of MJO, the *frictionally coupled moist Kelvin-Rossby wave theory,* to explain the essential dynamics of the MJO (Wang 1988, Wang and Rui 1990b). His theory addressed why MJO possesses a coupled Kelvin-Rossby wave structure, how these two types of waves can couple together through joint boundary layer moisture convergence and convection, and why the coupled wave packet selects slow eastward movement and has a planetary zonal circulation scale. This theory finds firm support in observations. Recently, this theory has been further extended to include the moisture feedback and developed into a unified Trio-Interaction Theory of MJO (Wang et al. 2016), providing a unified theoretical framework for understanding the essential dynamic of the MJO.

Wang and his student established a theory for Boreal Summer Intraseasonal Oscillation (BSISO) that explains the origin of the break-active monsoon cycles (Wang and Xie 1997). The theory highlights how the monsoon vertical wind shear and moist static energy distribution control ISO disturbances' propagation and variance as well as sustain the active-break monsoon cycles, in particular, the mechanisms of the northward propagation due to the effects of monsoonal vertical wind shear.

Wang and his postdoc fellows first proposed the concept of MJO diversity (Wang et al. 2019) and revealed their linkage to boundary forcing, opening a new avenue for improving MJO simulation and prediction (Xiang et al. 2021).

d. ENSO

Wang and his students discovered the interdecadal changes in the ENSO onset, periodicity, and spatial structure of ENSO in the late 1970s and attributed these changes to the shift in the Pacific mean state (Wang 1995**;** Wang B. and Y. Wang, 1996, An and Wang 2000). He and his collaborators further proposed a theory to explain why there is a coherent change in frequency, amplitude, spatial structure and propagation, and why the change of El Nino properties has concurred with the extratropical Pacific interdecadal climate shift (Wang and An 2001).

Wang and his collaborators proposed a new perception of ENSO diversity based on its evolution from pre-onset to mature phase and revealed the historical change of El Nino diversity caused by the western Pacific warming, illuminating the factors controlling the future change of the extreme El Nino (Wang et al. 2019).

Wang and collaborators revealed an accelerated trend of multiyear La Niña over the past century, and the link between multiyear La Niña events and background western Pacific warming. The later promoted a prominent onset rate and enhanced zonal advective and thermocline feedback to sustain La Niña persistence (Wang et al. 2023).

e. Tropical dynamics and atmosphere-ocean interaction

Wang and his student established *a theory on vertical wind shear impacts on equatorial waves.* The theory extends Matsuno's (1966) theory to elucidate background flow and heating effects on equatorial waves (Wang and Xie 1996). The theory reveals that (a) westerly (easterly) vertical shear can trap equatorial Rossby waves to the upper (lower) troposphere; (b) vertical wind shear enables emanation of barotropic Rossby waves from the equator into extratropics; (c) an easterly vertical shear can dramatically change the horizontal structure of the moist equatorial Rossby waves. The theory shed light on equatorial-extratropical teleconnection, the wave energy accumulation in the equatorial westerly duct, and the equatorially asymmetric structure of an equatorial heating-induced atmospheric response.

Wang and Xie (1998) advanced a theory to elaborate on the coupled instability of the warm pool climate system. They demonstrated that the warm pool ocean-atmosphere interaction is conducive to intraseasonal, unstable coupled atmosphere-ocean modes through positive wind-evaporation/entrainment and cloud-radiation feedbacks. The theory explains observed features of the co-variability of MJO and ocean mixed layer variability that is confirmed by GCM experiments.

Wang and his student discovered the *boreal summer Circum-Global Teleconnection* (Ding and Wang 2005), which is the counterpart of the winter Pacific-North America teleconnection. This finding lays a foundation for northern summer extratropical seasonal and intraseasonal predictions.

Wang and Chan (2002) elucidated the mechanism by which ENSO affects tropical storm activity in the WNP, which offers a physical basis for the seasonal prediction of tropical storms. A dynamic genesis potential index (DGPI) for tropical cyclone was advanced (Wang and Murakami 2020), which is suitable for interpreting TCG climate variability and response to anthropogenic forcing (Murakami and Wang 2022).

Wang and collaborators revealed the fundamental sources of predictability of the western Pacific Subtropical High, which paved a new way for seasonal prediction of East Asian rainfall and WNP tropical storm activities (Wang et al. 2013**)**.

f. Led "Climate Prediction and its Application to Society" project in support of Asian Pacific Economic Cooperation (APEC) Climate Center, which has provided leadership in two international dynamical model experiments: the "Multi-model Seasonal Hindcast Experiment" in 2005-2006 and the "Intraseasonal Variability Hindcast Experiment" in 2009-2010. More than a dozen climate models worldwide participated in each of these experiments.

II.4 Major publications

a. Monsoon dynamics and predictability

Wang, B., R. Wu, and X. Fu, 2000: Pacific-East Asia teleconnection: How does ENSO affect East Asian climate? *J. Climate*, 13, 1517-1536. (citation 3045)

Wang, B., and Z. Fan, 1999: Choice of South Asian Summer Monsoon Indices. *Bull. Amer. Meteor. Sci.*, 80, 629-638. (citation 983)

Wang, B., R. Wu, K.-M. Lau, 2001: Interannual variability of Asian summer monsoon: Contrast between the Indian and western North Pacific-East Asian monsoons. *J. Climate,* 14, 4073-4090. (citation 1169)

Wang, B., R. Wu, T. Li, 2003: Atmosphere-Warm Ocean interaction and its impact on Asian-Australian Monsoon variation. *J. Climate*, 16, 1195-1211. (citation 816)

Wang, B., I.-S. Kang, and J.-Y. Lee, 2004: Ensemble Simulations of Asian–Australian Monsoon Variability by 11 AGCMs. *J. Climate*, 17, 803–818. (citation 434)

Wang, B., Q. Ding, X. Fu, I.-S. Kang, K. Jin, J. Shukla, and F. Doblas-Reyes, 2005: Fundamental challenges in simulation and prediction of summer monsoon rainfall, *Geophys. Res. Lett.*, Vol. 32, No. 15, L15711,doi: 10.1029/2005GL022734 12. (citation 721)

Wang, B, Q Bao, B Hoskins, G Wu, Y Liu, 2008a: Tibetan Plateau warming and precipitation changes in East Asia, *Geophys. Res. Lett* 35 (14), L14702. (citation 671)

Wang, B., Z. Wu, J.-P. Li, J. Liu, C.-P. Chang, Y. Ding, and G.-X. Wu, 2008: How to Measure the Strength of the East Asian Summer Monsoon? *J. Climate*, 21, 4449-4463. (citation 644)

Wang, B. and Q. Zhang, 2002: Pacific-East Asia teleconnection, Part II: How the Philippine Sea anticyclone is established during El Nino development, *J. climate*, 15 (22), 3252-3265. (citation 510).

Yu, R., B. Wang and T. Zhou, 2004: Tropospheric cooling and summer monsoon weakening trend over Eat Asia, *Geophys. Res. Let.,*31 (22), (citation 522)

Wu, Z., B. Wang, J. Li, and FF Jin, 2009: An empirical seasonal prediction model of the East Asian summer monsoon using ENSO and NAO. *Journal of Geophysical Research: Atmospheres* 114 (D18). (citation 523)

Wang, B., J.-Y. Lee, I.-S. Kang, J. Shukla et al. 2009: Advance and prospectus of seasonal prediction: assessment of the APCC/CliPAS 14-model ensemble retrospective seasonal prediction (1980-2004), *Climate Dynamics* 33 (1), 93-117. (citation 469)

Wang, B., LinHo, Y. Zhang, and M.-M. Lu 2004: Definition of South China Sea monsoon onset and commencement of the East Asia summer monsoon, *J. Climate*, 17(4) 699=710. (citation 434)

Wang, B. and X. Xu, 1997: Northern hemisphere summer monsoon singularities and climatological intraseasonal oscillation, *J. Climate*, 10 (5), 1071-1085. (citation 323)

Wang, B., J. yang, T. Zhou, and B. Wang 2008: Interdecadal changes in the major modes of Asian-Australian monsoon variability: strengthening relationship with ENSO since the late 1970s. *J. Climate*, 22(11), 3006-3030. (citation 279)

Wang, B., Z. Wu, C.-P. Chang, J. liu, J. Li, and T. Zhou, 2010: Another look at interannual-to-interdecadal variations of the east Asian winter monsoon:The northern and southern temperature modes, *J. Climate*, 23(6) 1495-1512. (citation 280)

b. Conceptual development of Global Monsoon and Asian monsoon

Wang, B., 1994: Climatic regimes of tropical convection and rainfall. *J. Climate*, 7, 1109-1118. (citation 152).

Wang, B. and LinHo, 2002: Rainy seasons of the Asian-Pacific monsoon. *J. Climate*, 15, 386-398. (citation 1,565)

Wang, B., and Q. Ding 2008: Global monsoon: Dominant mode of annual variation in tropics. Dynamics of Atmosphere and Ocean, 44 (3-4), 165-183. (citation 509)

Wang, B. and Q. Ding 2006: Changes in global monsoon precipitation over the past 56 years, *Geophys. Res. Lett.*, 33 (6), L06711. (citation 380)

Wang, B., J. Liu, H.-J. Kim, P.J. Webster, and S.-Y. Yim, 2012: recent change of the global monsoon precipitation (1979-2008), Climate Dynamics, 39(5), 1123-1135. (citation 451).

Wang, B., Liu J., Kim HJ, Webster PJ, Yim SY, and Xiang B., 2013: Northern Hemisphere Summer Monsoon Intensified by Mega-El Nino-Southern Oscillation and Atlantic Multidecadal Oscillation, *PNAS*, doi:10.1073/pnas. 1219405110. (citation 361)

Liu, J., B. Wang, M. Cane, S.-Y. Yim, and J.Y. Lee, 2013: Divergent global precipitation changes induced by natural versus anthropogenic forcing. *Nature*, 493(7434), 656-659, doi: 10.1038/nature11784. (citation 215)

Wang, B., J. Li, M.A. Cane, J. Liu, P.J. Webster, B. Xiang, H.-M. Kim, J. Cao, and K.-J. Ha, 2018: Toward predicting changes in land monsoon rainfall a decade in advance. *J. Climate*, 31, 2699-2714. (citation 68)

Lee, J.-Y. and B. Wang, 2014: Future change of global monsoon in the CMIP 5. *Climate Dynamics*, 42 91), 101-119. (citation 489).

Wang, P-X., B. Wang, H. Cheng, J. Fasulo, Z.-T. Guo, T. Kiefer, and Z. liu, 2017: global monsoon across time scales: Mechanism and outstanding issues. *Earth Science Review*, 174, 84-121. (citation 363)

Wang, B., M. Biasutti, M. P. Byrne, C. Castro, C.-P. Chang et al. 2021: Monsoons climate change assessment, Bulletin of the American Meteorological Society 102 (1), E1-E19. (citation 168)

Wang, B., C. Jin, and J. Liu, 2000: Understanding future change of global monsoon projected by CMIP6 models. J. climate, 33(15) 6471-6489. (citation 189)

c. Tropical Intraseasonal Oscillation

Wang, B., and H. Rui, 1990a: Synoptic climatology of transient tropical intraseasonal convection anomalies. *Meteor. Atmos. Phys.*, 44(1-4), 43-61. (citation 655)

Wang, B. and X. Xie, 1997: A model for the boreal summer Intraseasonal Oscillation. *J. Atmos. Sci.*, 54, 72-86. (citation 517)

Rui, H., and B. Wang, 1990a: Development characteristics and dynamic structure of tropical intraseasonal convection anomalies. *J. Atmos. Sci.*, 47, 357-379. (citation 459)

Wang, B., and H. Rui, 1990b: Dynamics of coupled moist Kelvin-Rossby waves on an equatorial beta-plane. *J. Atmos. Sci.*, 47, 397-413. (citation 368)

Lee, J.-Y., B. Wang, M.C. Wheeler, X. Fu, D. E. waliser, and X. Fu, 2013: real-time multivariate indices for the boreal summer intraseasonal oscillation over the Asian summer monsoon region. Climate Dynamics, 40(1) 493-509. (citation 472)

Kemball-Cook, S. and B. Wang, 2001: Equatorial waves and air-sea interaction in boreal summer intraseasonal oscillation. *J. Climate*, 14 (13), 2923-2942. (citation 443).

Fu, X. B. wang, and J. P. McCreary, 2004: Coupling between northward propagating, intraseasonal oscillation and sea surface temperature in the Indian Ocean, J. Atmospheric Sciences, 60(15), 1733-1753. (citation 319).

Kikuchi, K., B. Wang, and Y. Kajikawa, 2012: Bimodal representation of the tropical intraseasonal oscillation. Climate Dyn., 38, 1989-2000, doi: 10.1007/s00382-011-1159-1. (289)

Wang, B., F. Liu, and G. Chen, 2016: A trio-interaction theory for Madden–Julian oscillation. *Geosci. Lett.*, 3:34, doi: 10.1186/s40562-016-0066-z. (Citation 100)

423. Zhang, C., A.F. Adames, B. Khouider, B. Wang, and D. Yang, 2020: Four theories of the madden-Julian Oscillation. Reviews of Geophysics, doi:10.1029/2019RG000685. (113)

Wang, B., G. Chen, and F. Liu 2019: Diversity of Madden-Julian Oscillation, *Science Advance*, 5(7), eaax0220. (citation 97)

d. ENSO

Wang, B., 1995: Interdecadal changes in El Nino onset in the last four decades. *J. Climate*, 8, 267-258. (citation 776)

An, S.-I., and B. Wang, 2000: Interdecadal change of the structure of ENSO mode and its impact on the ENSO frequency. *J. Climate*, 13, 2044-2055. (citation 535)

_____Wang, B., X. Luo, Y.M. yang, W. Sun, M. A. Cane, W. Cai, S. W. Yeh, and J. Liu, 2019: Historical change of El Nino properties shed light on future changes of extreme El Nino. *PNAS*, 116 (45) 22512-22517. (citation 287)

_____Wang, B., and Y. Wang, 1996: Temporal structure of the Southern Oscillation as revealed by waveform and wavelet analysis. *J. Climate*, 9, 1586-1598 (citation 318)

Wang, B. and S. -I. An, 2001: Why the properties of El Nino change in the late 1970s? *Geophys. Res. Lett.,* 28, 3709-3712. (citation 197)

Wang, B., and S.-I. An, 2002: A mechanism for decadal changes of ENSO behavior: Roles of background wind changes. Climate Dyn., 18, 475-486. (196)

Wang, B. and Z. Fang, 1996: Chaotic oscillations of tropical climate: A dynamic system theory for ENSO, J. Atmos. Sci., 53 (19), 2786-2802. (citation 148)

Wang, B., A. Barcilon, and FZ. Fang, 1999: Stochastic dynamics of El Nino-Southern Oscillation, J. Atmos. Sci., 56 91), 5-23. (citation 126)

e. Climate dynamics

Ding, Q.H. and B. Wang, 2005: Circurmglobal teleconnection in northern hemisphere summer, *J. Climate*, 18 3483-3505. (citation 1077)

Wang, B., and J. C. L. Chan, 2002: How strong ENSO events affect tropical storm activity over the Western North Pacific. *J. Climate*, 15, 1643-1658. (citation 1121)

Wang, B., B. Xiang, and JY Lee, 2013: Subtropical High predictability establishes a promising way for monsoon and tropical storm predictions, *PNAS 10.1073/pnas.1212646110*. (598)

Li, T., B. Wang, C.-P. Chang, and Y. Zhang, 2003: A theory for the Indian Ocean dipole-zonal mode, J. Atmospheric Sciences, 60(17) 2119-2135. (citation 425)

Ding, Q.-H., B. Wang, M. Wallace, and Branstator, 2011: Tropical-extratropical teleconnections in boreal summer: observed interannual variability. J. Climate, 24, 1878-1896. (274)

Wang, B. and H. Murakami, 2020: dynamic genesis potential index for diagnosing present-day and future global tropical cyclone genesis, *Environ. Res. Let*., 15(11) 114008. (citation 63)

f. Atmospheric dynamics and atmosphere-ocean interaction

_____Wang, B., 1988: Dynamics of tropical low frequency waves: An analysis of moist Kelvin waves. *J. Atmos. Sci.*, 45, 2051-2065. (citation 368)

_____Wang, B., and X. Xie, 1996: Low-Frequency equatorial waves in vertically shear flow. Part I: Stable waves. *J. Atmos. Sci.*, 53, 449-467. (citation 343)

Kikuchi, K., and B. Wang, 2008: Diurnal precipitation regimes in the global tropics. J. Climate, 21, 2680-2696, doi: 10.1175/2007JCLI2051.1. Full paper. (344)

Wang, B., and X. Xie, 1998: Coupled Modes of the Warm Pool Climate System Part I: The Role of Air-Sea Interaction in Maintaining Madden-Julian Oscillation. *J. Climate*, 11, 2116-

2135. (citation 267)

Wang, B., and T. Li 1994: Convective interaction with boundary layer dynamics in the development of a tropical intraseasonal system, *J. Atmos. Sci.,* 51 (11), 1386-1400. (citation 252)

Wang, B., B. Q. Xiang, J. Li, P. J. Webster, M. N. Rajeevan, J. Liu, and K. J. Ha, 2015: Rethinking Indian monsoon rainfall prediction in the context of recent global warming. Nature Communications, 6:7154 | doi: 10.1038/ncomms8154. Full paper. (205)

Wang, B. and T. Li, 1993: A simple tropical atmospheric model of relevance to short term climate variations. J. Atmos. Sci., 50 (2), 260-284. (citation 192)

Xie, X. and B. Wang, B, 1996: Low-Frequency equatorial waves in vertically shear flow. Part II: Unstable waves. J. Atmos. Sci., 53 (23), 3589-3605. (citation 170)

Selected Book edited and book chapters

"The *Asian Monsoon", 2006, Ed. B. Wang*, Springer/Praxis Publishing Co., New York, pp787.

Hoskins, B., and B. Wang, 2006: Large scale dynamics, in "The Asian Monsoon", Ed. B. Wang, Springer/Praxis Publishing. New York, pp 357-415.

Wang, B.: Theory, Chapter 10 in Tropical Intraseasonal Oscillation in the Atmosphere and Ocean. Eds. William K.-M. Lau and D. E. Waliser. Praxis Publishing. Second addition, 2011.

III. TEACHING/MENTERING

III-1. Courses taught

MET 450: Synoptic Analysis
MET 495: Undergraduate Thesis
MET 650: Advanced theoretical meteorology I
MET 651: Advanced theoretical meteorology II
MET 600: Atmospheric dynamics I
MET 601: Atmospheric dynamics II
MET 610: Tropical climate and weather
MET 616: Monsoon Dynamics
MET 745: Dynamics in Midlatitude
MET 746: Tropical dynamics
MET 752: Special topics: Climate Dynamics
OCN 760: Atmosphere-Ocean interaction and climate
MET 699: Directed individual studies
MET 765b: Seminar in meteorology: general
MET 765c: Seminar in meteorology: research results

III-2 Advisor and mentor

- Current: Mentor to 2 postdoctoral fellows and Major Professor to 2 Ph D graduate students
- Advisor to 32 Ph D: Tim Li(1994), Xiaofan Li(1995), Xiaosu Xie(1996), Xiouhua Fu(1999), Renguang Wu(2000), Liguang Wu(2001), Karen Lee Drohblav(2003), Heidi Teng(2004), Zhuo Wang (2005), Bo Yang(2005), Justin Ventham (2007), Qinghua Ding(2008), Zhiwei Wu (2009), Jing Yang (2010), Yuxing Yang (2010), Xiaqiong Zhou(2010), Hong Wang(2011), Baoqiang Xiang (2011). Shibin Xu (2013), Wen Xiong

(2015), Gary Grunseich (2016), Xiao Luo (2016), Miaoni Gao (2017), Jian Cao (2016), Hui Shi (2019), Alexanser Ludert (2018), Bin Liu (2019), Weiyi Sun (2020), Sihua Huang (2020), Yifei Dai (2021), Chunhan Jin (2021), Zhiling Xie (2021),

- Co-advisor to 3 Ph D graduates: Suhong Ma, Qing Bao, Caiyun Zhang
- Advisor to10 MS graduates: H. Rui, C. Wan, Y. Wang, X. Wang, P. Goda, H. Teng, Z. Wang, C. Orndoff, Q. Ding, Kevin Mallan.
- Mentor to more than 37 Postdoctoral fellows/visiting scientists.
- Served on 22 Ph. D committees and 15 M. S. committees in the last ten years. Ph D committee since 2007: Chamber, Shin Chang, Pierre Detrieux, Bing Fu, Seon-Tae Kim, Seon-Shan Lee, Kat Scalon, Thien V Le, K.-S. Yun, Chunhua Zhou, Lei Zhang
- More than 30 visiting professor/scientists (longer than one month) have been sponsored for their visits.

IV. PROFESSIONAL SERVICE

IV-1 Editorships

- 2015-present: TAO International Advisory Board.
- 2005-2009: Editor, *Journal of Atmospheric Sciences*, American Meteorological Society.
- 2008-2011: Editor, *Asian-Pacific J. of Atmos. Sci.*.
- 2004-2007: Editor, *Journal of the Korean Meteorological Society*.
- 2001-Present: Associated Editor, *Advances in Atmospheric Sciences*.
- 2001-Present: Advisory board, World Scientific Publishing Company's Book Series on East Asian Meteorology.
- 1999-Present: Editorial Board Member, *Acta Meteorologica Sinica,* Chinese Meteorological Society.
- 2001-Present: Editorial Board Member, *Chinese Journal of Oceanology and Limnology,* 01/02-present.

IV-2 Organizer-International conferences (2007-2018)

- 2018: Organizer, Fourth International Symposium on Earth System Modeling. Nanjing University of Information Science and Technology, Nanjing, China. July 11-12 2018.
- 2017: Organizer, Third International Symposium on Earth System Modeling. Nanjing University of Information Science and Technology, Nanjing, China. June 11-12 2017.
- 2015: Organizer, Second International Symposium on Earth System Modeling. Nanjing University of Information Science and Technology, Nanjing, China. Oct 15-16 2015.
- 2014: Organizer, First International Symposium on Earth System Modeling. Nanjing University of Information Science and Technology, Nanjing, China. April 2014.
- 2013: Co-organizer, Open Science Meeting of Asian Monsoon Years (200702012), Zhuhai, China. October 25-26, 2013.
- 2012: Co-organizer, Atmospheric Science Section/AOGS (Asian-Oceanic Geophysical Society)-AGU (WPGM) 2012 Assembly, Singapore, Aug 13-17, 2012.
- 2012: Co-organizer, International Workshop on Interdecadal Variability of Global Monsoons, Nanjing, China, 10-12 September 2012.

- 2010: Co-organizer, IGBP/PAGES Second Global Monsoon Symposium, September 13-15, 2010, Shanghai.
- 2009: Co-organizer, Sixth International Workshop on Asian Monsoon Years (2007-2012), November 30-December 1 2009, Kunming, China.
- 2009: Co-organizer, Fifth International Workshop on Asian Monsoon Years (2007-2012), August 12, 2009, Singapore.
- 2008: Co-organizer, WMO Fourth International Workshop on Monsoons (IWM-IV), 20-25 October 2008, Beijing.
- 2008: Co-organizer, IGBP/PAGES First Global Monsoon Symposium, Oct 29-Nov2, 2008, Shanghai.
- 2008, Director, Advanced Institute on "The Asian monsoon system: Prediction of change and variability", START/AAMP, January 2-12 2008, Honolulu, Hawaii.
- 2007: Co-organizer, Second International workshop on Asian Monsoon Years (2007-2012), September 3-4 2007 Bali, Indonesia.

IV-3 Convener/ Chairs, International Conferences (2001-2006)

- Co-Chair, Organizing Committee, Decadal-Centennial Variability of East Asian monsoon, July 7-9 2006, Qingdao, China.
- International Science committee, Winter MONEX: A Quarter Century and Beyond, April 4-7 2006, Kuala Lumpur.
- Session Chair, AMS 14th Conference on Interactions of atmosphere and Sea, January 2006, Atlanta, Georgia.
- Academic committee of organization, International Symposium on Active Geosphere, November 8-11, 2005, Wuhan, China.
- Co-Convener, session C1, IAMAS2005 Conference 2-11 August, Beijing, China.
- Academic Committee, International Symposium on Tropical Weather and Climate, November 8-12, 2004, Guangzhou, China.
- Vice- Chair, WMO 3rd International Workshop on Monsoon (IWM-3), November 1-5, 2004, Hangzhou, China.
- Organizing Committee and Session Chair, AMS 13th Conference on Interactions of the Sea and Atmosphere, August 9-13, 2004, Portland, Maine.
- Session Chair, AGU western Pacific Meeting, August 2004, Honolulu, US.
- Academic Committee, Third International Ocean-Atmosphere Conference, July 14-16, 2004, Beijing, China.
- Organization Committee Chair, International Asian Monsoon Symposium, February 18-20, 2004, Honolulu, Hawaii.
- Discussion Panelist and Session Chair, APCN Symposium on the Multi-Model Ensemble for Climate Prediction, October 7-11, 2003, Jeju, Korea.
- Session co-convener, IUGG 2003 General Assembly, June 30-July 11, 2003, Sapporo, Japan.
- Organizing Committee and Session Chair, AMS 12th Conference on Interactions of the Sea and Atmosphere, February 9-13, 2003, Long beach, CA, USA.
- Rapporteur, Fifth WMO/ICSU international workshop on tropical cyclones, Dec. 2-13, 2002, Cairns, Australia.

- Organizing Committee and Session Chair, 25th Hurricane and Tropical Meteorology Conference, AMS, April 29-May 3, 2002, San Diego, California, USA.
- Session Chair, IAMAS, 8th Scientific Assembly, 10-18 July 2001 Innsbruck, Austria.
- Session Convener, AMS 11th conference on interaction of air and sea, May 14-18 2001, San Diego.
- Session Chair, Scientific Conference on the South China Sea Monsoon Experiment (SCSMEX), April 17-20, 2001, Shanghai, China.
- Co-Organizer, Workshop on Intraseasonal to Interdecadal variability of the East Asian monsoon, March 17-18, 2001, Taipei, Taiwan.

IV-4 Professional Organizations

- American Meteorological Society
- Royal Meteorological Society
- American Geophysical Union

IV-5 Referees

Served as referees for over 40 professional journals, which include: Science, Nature, PNAS , Nature Geosciences, Nature Climate Change, Nature communication, Nature Science report, J. Atmos. Sci., J. Climate, J. Geophys. Res., Mon. Wea. Rev., Tellus, Climate Dynamics, Meteor. and Atmos. phys., J. Phys. Oceanogr., Bull. A. M. S., Geophys. Res. Let., Deep Sea Research, J. Meteor. Soc. Japan, J. Applied Meteorol., Dynamics. Atmos. Oceans, Weather and Forecasting, Theoret. Appl. Climatol., Atmos. and Oceans, Acta Meteorologica Sinica, Atmosfera, Annales Geophysicae, Advances in Atmos. Sci., Terrestial and Atmos. Sci., Chinese Journal of Atmospheric Sciences, Journal of polar research, Chinese Journal of Oceanology and Limnology. Reviewing proposals for NSF, NOAA, NASA, DOE, ONR, FRD. External examiner of Ph D dissertations for universities in Australia, South Africa, China, and Hong Kong.

IV-6 SERVICES AT UH

Department Chair, Jul 2010-2014.
Search Advisory Committee for the Dean of SOEST, 2004.
Steering Committee, International Pacific Research Center, 1999-.
Research Council, School of Ocean and Earth Science and Technology, UH, 1996-2000.
Chair, Department Personnel Committee, Dept. of Meteorology, 1990-1993, 1997-1998.
Chair, Department computing committee (2001-2003).
Chair, Meteorology Graduate Program, UH, 1993-1997.
Graduate Council Member, University of Hawaii, 1993-1997.
UH Tenure and Promotion Recommendation Committee member, 1991, 1995.
SOEST/UH Computing Committee, 1990.
Chair, SOEST Faculty Searching Committee, 1992-93.
Associate Director of the Meteorology and Physical Oceanography division, SOEST, 1991.