CURRICULUM VITAE **July 17, 2023**

Michael James McPhaden
NOAA/Pacific Marine Environmental Laboratory
7600 Sand Point Way NE
Seattle, Washington 98115
P: 206-526-6783; F: 206-526-6744

E-mail: Michael.J.Mcphaden@noaa.gov

PROFESSIONAL EXPERIENCE

2007-present	Director, Global Tropical Moored Buoy Array (GTMBA) Project Office Pacific Marine Environmental Laboratory, Seattle, Washington
1992–2007	Director, Tropical Atmosphere Ocean (TAO) Array Project Office Pacific Marine Environmental Laboratory, Seattle, Washington
1998–present	Senior Scientist, Pacific Marine Environmental Laboratory, Seattle, Washington
1993–present	Affiliate Professor, School of Oceanography, University of Washington
1992–1998	Supervisory Oceanographer GM-15, Pacific Marine Environmental Laboratory, Seattle, Washington
1991–1992	Oceanographer, GS-15, Pacific Marine Environmental Laboratory, Seattle, Washington
1990–present	Senior Fellow, Cooperative Institute for Climate, Ocean, and Ecosystem Studies (formerly Joint Institute for the Study of the Atmosphere and Ocean), University of Washington
1990–1993	Affiliate Associate Professor, School of Oceanography, University of Washington
1988–1990	Affiliate Assistant Professor, School of Oceanography, University of Washington
1987–present	Senior Fellow, Cooperative Institute for Marine and Atmospheric Research (formerly Joint Institute for Marine and Atmospheric Research), University of Hawaii
1986–1991	Oceanographer GS-14, Pacific Marine Environmental Laboratory, Seattle, Washington
1984–1986	Research Assistant Professor, School of Oceanography, University of Washington
1982–1984	Visiting Research Scientist, Joint Institute for the Study of the Atmosphere and Ocean, University of Washington
1980–1982	Research Scientist, Oceanography Section, National Center for Atmospheric Research

EDUCATION

1980	Scripps Institution of Oceanography, Ph.D., Physical Oceanography: Dissertation title: "Models of the Equatorial Ocean Circulation"
1973	State University of New York at Buffalo, B.S., Physics, magna cum laude

HONORS, AWARDS and CITATIONS

Listed in Web of Science as Highly Cited Researcher in Cross-Field (Interdisciplinary) Science, 2019, 2020, 2021, 2022
AGU College of Fellows Distinguished Lecturer, 2021-2023
Listed in Reuters Hot List of Most Influential Climate Scientists, 2021
Editors' Citation for Excellence in Refereeing, *Journal of Geophysical Research-Oceans*, 1995,
2016 Sverdrup Gold Medal, American Meteorological Society, 2016
Fellow, American Geophysical Union, 2014
Priestley Lecture, Commonwealth Scientific and Industrial Research Organisation, Australia, 2012
President, American Geophysical Union, 2010 - 2012
Fridtjof Nansen Medal, European Geosciences Union, 2010
Nobel Peace Prize (shared) for contributions to Assessments of the Intergovernmental Panel on Climate Change, 2007
Fellow, American Meteorological Society, 2007

Guest Professor, Ocean University of China, 2006 Fellow, the Oceanography Society, 2005
Scientific American "Science & Technology Web Awards" for El Niño Theme Page, 2005
Presidential Rank Award for Meritorious Federal Service, 2004
Listed in Web of Science as Highly Cited Researcher in Geosciences, 2004
Grace Hopper Government Technology Award ("Gracie Award") for TAO Project Leadership in the Innovative Application of Information Technology, 2003
American Geophysical Union, Frontiers of Geophysics Lecturer, 2002 Western Pacific Geophysics Meeting
American Meteorological Society, Walter Orr Roberts Lecturer, 2002
American Meteorological Society, Special Award for Completing and Maintaining the TAO Array, 1999
Public Service Award, Federal Executive Board, Seattle, 1999
American Geophysical Union, Sverdrup Lecturer, Fall 1998 Meeting
Department of Commerce, Gold Medal, 1997
NOAA/OAR Outstanding Publication Award, 1999, 2000, 2002, 2004
NOAA/PMEL Outstanding Publication Award, 1989–1993, 1995, 1997, 1998, 2007
Phi Beta Kappa

PROFESSIONAL SOCIETIES

The Oceanography Society, 1988–present
American Geophysical Union, 1979–present
The American Meteorological Society, 1978–present
The European Geosciences Union, 2005–present
Marine Technology Society/IEEE, 1990

PROFESSIONAL SERVICE ACTIVITIES

Member, AGU Legacy Committee, 2021-present
Member, Program Advisory Group for the UK-US Changing North Atlantic Program, 2021-present.
Member, Scientific Organizing Committee, WCRP-CLIVAR Workshop on Climate Interactions Among the Tropical Basins, 2021
Co-convenor, AGU Fall Meeting Special Session on ENSO in a Changing Climate, 2020
Member, International CLIVAR ENSO Conceptual Models Focus Group, 2020-present
Session co-chair, International Indian Ocean Science Conference (IIOSC-2020), Goa, India, 2020
Member, International CLIVAR Tropical Basin Interaction Research Focus Group, 2019-present
Member, The Oceanography Society Honors Nomination Committee, 2019-2021
Member, National Research Council Postdoc Mentoring Guide Review Committee, 2019-2020
Co-convenor, ENSO Science Symposium, Hobart, Australia, January 2019
Guest Editor, Ocean Dynamics (50th anniversary Liege Colloquium edition), 2018
Co-convenor, Second workshop on the Korea-US Indian Ocean Scientific (KUDOS) Research Program, San Diego, CA, 2018
Chair, Oceanographic Research Awards Committee, American Meteorological Society, 2019
Member, Awards Oversight Committee, American Meteorological Society, 2019
Member, Oceanographic Research Awards Committee, American Meteorological Society, 2017-2018
Member, Suomi Technology Medal Award Committee, American Meteorological Society, 2018-2019
Co-chair, Scientific Organizing Committee, Fourth International ENSO Conference, Guayaquil, Ecuador, 2018
Member, International review committee for the Tropical Atlantic Observing System, 2017–2018.
Member, Advisory Committee, Centre for Southern Hemisphere Ocean Research (CSHOR), Hobart, Australia, 2017-2022
Co-convenor, First workshop on the Korea-US Indian Ocean Scientific (KUDOS) Research Program, Seoul, South Korea, 2017
Member, Oceanographic Research Awards Committee, American Meteorological Society, 2017-2018
Member, The Oceanography Society Fellows Evaluation Committee, 2017-2019

Member, US IIOE-2 Scientific Steering Committee, 2016 - present
Member, AGU Bowie Medal Committee, 2015-2018
Vice-Chair, AGU Development Board, 2015-2019
Chair, AGU Ethics Committee, 2015-2019
Member, Committee on Researcher Involvement in the AMS, 2015-2017
Member, International CLIVAR ENSO Diversity Task Team, 2015-2018
Convenor, AMS Annual Meeting Special Session on ENSO, Tropical Ocean-Atmosphere Interactions, and Global Climatic Impacts: 20 Years after TOGA, 2015
Member, RAPID-AMOC Program Advisory Committee, 2014-2019
Member, Indian Ocean GOOS (IOGOOS) Steering Committee, 2014-2019
Member, Scientific Organizing Committee, Third International ENSO Conference, Guayaquil, Ecuador, 2014
Convenor, AGU Fall Meeting Special Session on the 30th Anniversary of the 1982-1983 El Niño
Chairman, Scientific Organizing Committee, Tropical Atlantic Climate Variability Conference, Venice, Italy, 2013
President, American Geophysical Union, 2010 - 2012 (President-elect 2008 - 2010; Past President 2012-2014)
Member, Review Committee, University of Maryland Department of Atmospheric and Oceanic Science, 2011
Member, IUGG Nominations Committee, 2010-2011
Member, International Scientific Advisory Committee, Centro Internacional para la Investigacion del Fenomeno de El Niño (CIIFEN), 2010-present
Member, National Academy of Science Advisory Panel on National Security Implications of Climate Change for U.S. Naval Forces, 2009-2011
Member, MIT/WHOI Joint Program Review Committee, 2009
Member, RAPID-WATCH Program Advisory Committee, 2008-2014
Contributing author, IPCC Fourth Assessment Report, 2007
Convener, IUGG Symposium on Interannual to Interdecadal Climate Variability, 2007
Member, RAPID (Rapid Climate Change) Review Committee, February 2007
Member, Review Committee, Cooperative Institute for Climate and Ocean Research (CICOR), June 2005
President, Ocean Sciences Section, American Geophysical Union, 2002–2004
Member, Executive Committee, AGU Ocean Sciences Section, 2000–2008
Member, IOC/WMO Joint Commission on Oceanography and Marine Meteorology, observations Coordination Group, 2001–present
Member, International CLIVAR Global Synthesis and Observations Panel, 2004–2015
Member, International CLIVAR Indian Ocean Panel, 2003–present
Member, International CLIVAR Pacific Ocean Panel, 2001–present
Chairman, Tropical Moored Buoy Implementation Panel, 2001–present
Member, International CLIVAR/OOPC OceanSITES Working Group, 2000–present
Editorial Board, Bulletin of the American Meteorological Society, 2001–present
Member, PIRATA Steering Group, 1995–present
Member, International CLIVAR Ocean Observations Panel, 2000–2003
Member, OCEANOBS99 Conference Steering Committee, 1999
Member, AMS Committee on the Interaction of the Sea and the Atmosphere, 1999–2002
Member, O-CLIVAR Steering Group, 1996–1997
Member, Nominations Committee, The Oceanography Society, 1994–1996
Chairman, Pan American Climate Studies Subcommittee on Observations, 1994 –1996
Member, Organizing Committee, Final TOGA Conference, 1994–1995
Chairman, TAO Implementation Panel, 1992–2001
Member, Ocean Observing System Development Panel, 1992–1994
Member, International TOGA Scientific Steering Group, 1992–1994
Member, National Academy of Science Advisory Panel on Near-term Development of Operational Ocean Observations, 1991 – 1993

Member, WCRP Pacific Panel, 1990 – 1994
Member, International TOGA Scientific Steering Group Ad Hoc Committee on Moored Current Measurements, 1989
Member, WOCE Moored Measurements Implementation Panel, 1988 – 1991
Member, EPOCS Council, 1987 – 1994
Convener, The ENSO Event of 1986 – 1987 Fall AGU, San Francisco, 1987
Member, US/PRC bilateral air-sea interaction planning committee, 1986 – 1992
Member, WOCE Committee on Surface Layer Observations, 1986 – 1988
Convener, Equatorial Undercurrent Centennial Conference, Fall AGU, San Francisco, 1986
Co-Convener, Second International TOGA Workshop on Thermal Sampling, Hobart, Australia, November 1986
Convener, TOGA Thermal Data Center Workshop, Monterey, California, July 1985
Consultant, CCCO Pacific, Atlantic, and Indian Ocean Panels, 1984 – 1990
Co-Chairman, Pacific Subsurface Thermal Field Monitoring Steering Group 1984 – 1987
Member, U.S. Delegation to India, Indo-U.S. bilateral on monsoon variability, Bangalore, India, 1984
Co-Convener, Pacific Subsurface Thermal Field Monitoring Workshop, Seattle, 1984
Member, TOGA Pacific Drafting Workshop, Miami, 1983
Convener, Special Ocean/Atmospheric Sciences session on El Niño 1982 – 1983, Fall AGU Meeting, San Francisco, 1983
Member, Navy/NOAA Committee on Observational Strategies for Ocean Monitoring, Miami, 1983
Consultant, FOCAL/SEQUAL Programs, 1982 – 1986
Member, Tropic Heat Experiment Executive Committee, 1981 – 1982
Consultant, CAGE Feasibility Study Committee, 1981 – 1982
Member, Equatorial Theoretical Panel, 1978 – 1984

STUDENT RESEARCH SUPPORT

Ayden van den Berg	2023-Present
Ejha Siadari	2021-2022
Minghong Liu	2019-2020
Hillary Scannell	2015-2017
Guan Cong	2015-2016
Yi Wang	2011-2013
Jacob Wenegrat	2010-2015
Jean-Maxime Jardin	2007
Natalia Stephanova	2005–2008
Xuebin Zhang	2002–2007
Weimin Wang	1994–2000
Xuri Yu	1991–1999
Rusty Brainard	1991–1994
Ken Duvall	1987
Scott Springer	1986–1989
Mary Landsteiner	1985–1987
Jeff Proehl	1984–1988

STUDENT COMMITTEES

University of Washington
- Yakelyn Ramos Jauregui, Ph.D. 2023 (est.)
- Ajda Savarin, Ph.D., 2023
- Shirley Leung, Ph.D., 2020
- Nan-Husn Chi, Ph.D., 2019
- Hillary Scannell, M.S. (Chairman), 2018
- Jacob Wenegrat, Ph.D. (Chairman), 2015
- Chuanli Jiang, Ph.D., 2008
- Natalia Stephanova, M.S. (Chairman), 2008
- Xuebin Zhang, Ph.D. (Chairman), 2008
- Weimin Wang, Ph.D. (Chairman), 2000
- Xuri Yu, Ph.D. (Chairman), 1999
- Keith Brainard, Ph.D., 1995
- Joanna Meunch, Ph.D., 1995
- Scott Springer, M.S. (Chairman), Ph.D., 1990 William Kessler, Ph.D., 1989
- David Battisti, Ph.D., 1988
- Mary Landsteiner, M.S. (Chairman), 1988
- Jeff Proehl, Ph.D. (Co-Chairman), 1988

Naval Postgraduate School
- Rusty Brainard, Ph.D., 1994

University of Paris - VI
- Lucia Bunge, Ph.D., 2006
- Christophe Menkes, Ph.D., 1994

University of Toulouse – III
- Christelle Bosc, Ph.D., 2008
- Sophie Cravatte, Ph.D., 2003
- Takeshi Izumo, Ph.D., 2003

École Nationale Supérieure d'Ingénieurs
- Jean-Maxime Jardin, B.S., 2007

University of Maryland
- Gregory Foltz, Ph.D., 2003

Utah State University
- N.A. Hasan, Ph.D., 2024 (est.)
- Zachary Johnson, Ph.D., 2021

Brown University
- Weixuan (Rosa) Xu, Ph.D., 2022

Caltech
- Shirui Peng, Ph.D., 2024

Macquarie University, New South Wales, Australia
- Shayne McGregor, Ph.D., 2008

Ocean University of China, Qingdao, China
- Yi Wang, Ph.D., 2014

Chinese Academy of Sciences, Qingdao
Guan Cong, Ph.D., 2017

Andhra University, Visakhaptnam, India
B. Praveen Kumar, Ph.D. (thesis examiner), 2014

Anna University, Chennai, India
K.N. Navaneeth, Ph.D. (thesis examiner), 2022
Simi Mathew, Ph.D. (thesis examiner), 2019

POSTDOC SUPPORT AND SUPERVISION

Sree Lekha Jarugula	2021 - 2023
Yann Planton	2019 - 2023
Kandaga Pujiana	2017 - 2021
Lu Dong	2015 - 2017
Aaron Levine	2014 - 2018
Ebenezer Nyadjro	2012 - 2014
Joke Luebbecke	2011 - 2013
Iskhaq Iskandar	2009 - 2011
Motoki Nagura	2008 - 2010
Xuebin Zhang	2008
Regina Rodrigues	2005 - 2007
Greg Foltz	2003 - 2006
Weimin Wang	2000
Dongxiao Zhang	1999 - 2001
Daniela Turk	1999 - 2001
Xuri Yu	1999
Chris Meinen	1998 – 2000
Kenong Bi	1995 – 1996
Meghan Cronin	1993 – 1995
Janet Sprintall	1992 – 1993
Eric Johnson	1990 – 1992

UNDERGRADUATE MENTORING

W. Rhys Tellentire, Scripps Institution of Oceanography, NOAA Hollings Summer Intern, 2022
Connor DeLaune, University of Louisiana at Monroe, NOAA Hollings Summer Intern, 2022
Alex Hewitt, University of Washington, NOAA Lapenta Summer Intern, 2021
Robert van der Drift, North Carolina State University, NOAA Hollings Summer Intern, 2020

VISITING FELLOW SUPPORT

Dr. Roxy Mathew Koll (NRC Fellow), Indian Institute of Tropical Meteorology, India, 2018-2019
Dr. Wahyu Pandoe (Fulbright Fellow), Agency for the Assessment and Application of Technology (BPPT), Indonesia, 2014
Dr. Kunio Kutsuwada, Tokai University, 2000-2001
Dr. Kentaro Ando, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), 1994-1995
Dr. Yoshifumi Kuroda, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), 1990-1991

TEACHING EXPERIENCE

Lecturer, ENSO and Climate Dynamics Summer School, International Center for Theoretical Physics, Trieste, Italy, July 2022
Lecturer, ECCO Summer School, Friday Harbor, Washington, May 2019
Lecturer, GODAE OceanView International School: New Frontiers in Operational Oceanography, Mallorca, Spain, October 2017

Lecturer, CLIVAR-IPRC-WCRP ENSO Summer School, Puna, Hawaii, June 2008
Guest Lecturer, University of Washington, Ocean500: Current Problems in Oceanography, 2005, 2006, 2009
Lecturer, University of Rhode Island Summer School on Equatorial Dynamics, June 1991

OCEANOGRAPHIC RESEARCH CRUISES

RV *Baruna Jaya VII*, 20 February-9 March 2017, Jakarta to Sabang, Indonesia
RV *Fridtjof Nansen*, 18-27 November 2008, Mahe, Seychelles to Pemba, Mozambique
NOAA Ship *Ka'imimoana*, 10-23 September 2006, Nuku Hiva, French Polynesia to Honolulu, Hawaii (Chief Scientist)
NOAA Ship *Ka'imimoana*, 5-27 April 2005, San Diego, CA to Galapagos Islands, Ecuador
NOAA Ship *Ka'imimoana*, 1-23 March 2002, Honolulu, HI to Galapagos Islands, Ecuador (Chief Scientist)

NOAA Ship *Ka'imimoana*, 27 September-15 October 1997, San Diego, CA to Nuku Hiva, French Polynesia (Chief Scientist)
RV *Le Noroit*, 2-18 February 1992, Kwajalein, Marshall Islands to Noumea, New Caledonia
RV *Le Noroit*, 26 March-4 April 1991, Kwajalein, Marshall Islands to Noumea, New Caledonia
NOAA Ship *Malcolm Baldridge*, 20 April-22 May 1990, Honolulu, HI to Rodman, Panama (Chief Scientist)
Xiangyanghong #14, 12-28 October 1987, Pohnpei, Micronesia to Republic of Nauru
NOAA Ship *Oceanographer*, 17 October-10 November 1986, Seattle, WA to Manzanillo, Mexico (Chief Scientist)
RV *Marion Dufresne*, May-July 1983, Dakar, Senegal to La Reunion

REFEREED PUBLICATIONS

Athulya, K., M. S. Girishkumar, M.J. McPhaden, and S. S. Kolukula, 2023: Seasonal variation of the land breeze system in the southwestern Bay of Bengal and its influence on air-sea interactions. Journal of Geophysical Research: Oceans, 128, e2022JC019477. https://doi.org/10.1029/2022JC019477

Cai, W., F. Jia, S. Li, A. Purich, G. Wang, L. Wu1, B. Gan, A. Santoso, T. Geng, B. Ng, Y. Yang, D. Ferreira, G. A. Meehl, and M. J. McPhaden, 2023: Antarctic shelf ocean warming and sea ice melt affected by projected El Niño changes. Nature Climate Change. https://doi.org/10.1038/s41558-023-01610-x

Cai, W., B. Ng, T. Geng, F. Jia, L. Wu, G. Wang, Y. Liu, B. Gan, K. Yang, A. Santoso, X. Lin, Z. Li, Yi Liu, Y. Yang, F.-F. Jin, M. Collins, and M. J. McPhaden, 2023: Anthropogenic impacts on twentieth-century ENSO variability changes. Nat. Rev. Earth Environ., 4, 407-418. https://doi.org/10.1038/s43017-023-00427-8

Jiang, F., W. Zhang, F.-F. Jin, M. F. Stuecker, A. Timmermann, M. J. McPhaden, et al., 2023: Resolving the tropical Pacific/Atlantic interaction conundrum. Geophysical Research Letters, 50, e2023GL103777. https://doi.org/10.1029/2023GL103777

McPhaden, M. J. and C. Karamperidou, 2023: Ambushed in Paradise: La Niña Brought Deadly Drought to a Tropical Eden. Bull. Am. Meteorol. Soc., 104, 415-418.

De Rovere, F., D. Zanchettin, M.J. McPhaden, and A. Rubino, 2022: Assessment of radiative heating errors in Tropical Atmosphere Ocean Array marine air temperature measurements. *Environ. Res. Lett.,* 17.014040, DOI:10.1088/17 48-9326/ac42fc.

Geng, T., W. Cai, L. Wu, Y. Yang, S. Li, S. Wang, Z.Chen, and M. J. McPhaden, 2022: Emergence of changing Central-Pacific and Eastern-Pacific El Niño-Southern Oscillation in a warming climate. Nat. Commun. 13, 6616. https://doi.org/10.1038/s41467-022-33930-5

Guan, C., F. Tian, M.J. McPhaden, F. Wang, S. Hu, and R.-H. Zhang, 2022: Zonal structure of tropical Pacific surface salinity anomalies affects ENSO intensity and asymmetry. *Geophysical Research Letters*, *49*, e2021GL096197. https://doi.org/10.1029/2021GL096197.

Han, W., L. Zhang, G. A. Meehl, S. Kido, T.Tozuka, Y. Li, M. J. McPhaden, A. Hu, A. Cazenave, N. Rosenbloom, G. Strand, B. J. West, and W. Xing, 2022: Sea level extremes and compounding marine heatwaves in coastal Indonesia. Nature Communications, 13:6410. https://doi.org/10.1038/s41467-022-34003-3

Hasan, N.A., Y. Chikamoto, and M.J. McPhaden, 2022: The influence of tropical basin interactions on the 2020-22 double-dip La Niña. *Front. Clim*. https://doi.org/10.3389/fclim.2022.1001174.

Heukamp, F.O., P. Brandt, M. Dengler, F.P. Tuchen, M.J. McPhaden, and J.N. Moum, 2022: Tropical instability waves and wind-forced crosss-equatorial flow in the central Atlantic Ocean. *Geophys. Res. Lett.*, https://doi.org/10.1029/2022GL099325.

Jarugula, S.L., and M.J. McPhaden, 2022: Ocean mixed layer response to two post-monsoon cyclones in the Bay of Bengal in 2018. *J. Geophys., 127*, e2022JC018874 https://doi.org/10.1029/2022JC018874.

Liu, M., M.J. McPhaden, H.-L. Ren, M. A. Balmaseda, and R. Wang, 2022: Oceanic heat content as a predictor of the Indian Ocean Dipole. *J. of Geophys. Res*. 127. e2022JC018896. https://doi.org/10.1029/2022JC018896

McPhaden, M. J. and C. Karamperidou, 2022: La Niña Came to Eden. *Bulletin of the American Meteorological Society*, 103(12), E2862-E2877. https://doi.org/10.1175/BAMS-D-21-0343.1

Tuchen, F.P., P. Brandt, J. Hahn, R. Hummels, G. Krahmann, B. Bourlès, C. Provost, M.J. McPhaden, and J.M. Toole, 2022: Two Decades of Full-Depth Current Velocity Observations From a Moored Observatory in the Central Equatorial Atlantic at 0°N, 23°W. *Frontiers Mar. Sci*. doi: https://doi.org/10.3389/fmars.2022.910979.

Wang, G., W. Cai, A. Santoso, A. et al., 2022: Future Southern Ocean warming linked to projected ENSO variability. *Nat. Clim. Chang*. 12, 649–654. https://doi.org/10.1038/s41558-022-01398-2

Xu, W., J. Lee, B. Fox-Kemper, Y. Planton, and M. J. McPhaden, 2022: The Andes Affect ENSO Statistics, *Journal of Climate*, 35, 3477-3491. https://journals.ametsoc.org/view/journals/clim/35/21/JCLI-D-21-0866.1.xml

Cai, W., A. Santoso, M. Collins, et al., 2021: Changing Niño-Southern Oscillation in a warming climate. *Nat. Rev. Earth Environ*. https://doi.org/10.1038/s43017-021-00199-z.

Cai, W., B. Ng, T. Geng, L. Wu, A. Santoso, and M.J. McPhaden, 2021: Addendum: Butterfly effect and a self-modulating El Niño response to global warming. *Nature. 126*, e2020JC016840. https://doi.org/10.1038/s41586-021-03261-4.

Capotondi, A., A.T. Wittenberg, J.-S. Kug, K. Takahashi, and M.J. McPhaden, 2021: ENSO Diversity. In El Niño Southern Oscillation in a Changing Climate (eds M.J. McPhaden, A. Santoso amd W. Cai). AGU *Monograph*, doi:10.1002/9781119548164. ch4.

Feng, M., Y. Zhang, H.H. Hendon, MJ. McPhaden, and A.G. Marshall, 2021: Niño 4 west (Niño-4 W) sea surface temperature variability. *J. Geophys. Res., 126*, e2021JC017591. https://doi.org/10.1029/2021JC017591.

Girishkumar, M.S., J. Joseph, M.J. McPhaden, and E. Pattabhi Rama Rao, 2021: Atmospheric Cold Pools and Their Influence on Sea Surface Temperature in the Bay of Bengal. *J. Geophys. Res., 126,* e2021JC017297. https://doi.org/10.1029/2021JC017297.

Iskandar, I., M. Nagura, and M.J. McPhaden, 2021: Role of the eastern boundary-generated waves on the termination of 1997 Indian Ocean Dipole event. *Geosci. Lett. 8*, 35. https://doi.org/10.1186/s40562-021-00205-8.

Jin, Y., Z. Liu, and M.J. McPhaden, 2021: A Theory of the Spring Persistence Barrier on ENSO. Part III: The Role of Tropical Pacific Ocean Heat Content, *J. Climate, 34*, 8567-8577. https://doi.org/10.1175/JCLI-D-21-0070.1.

Karamperidou, C., M.F. Stuecker, A. Timmermann, K.-S. Yun, S.-S. Lee, F.-F. Jin, A. Santoso, M.J. McPhaden, and W. Cai, 2021: ENSO in a Changing Climate: Challenges, Paleo-Perspectives, and Outlook. In El Niño Southern Oscillation in a Changing Climate (eds M.J. McPhaden, A. Santoso and W. Cai). *AGU Monograph*, doi:10.1002/9781119548164.ch21.

Lee, J., Y.Y. Planton, P.J. Gleckler, K.R. Sperber, E. Guilyardi, A.T. Wittenberg, M.J. McPhaden and G. Pallotta, 2021: Robust evaluation of ENSO in climate models: How many ensemble members are needed? *Geophys. Res. Lett., 48,* e2021GL095041. https://doi.org/10.1029/2021GL095041.

McPhaden, M.J., A. Santoso, and W. Cai, 2021: Introduction to El Niño Southern Oscillation in a Changing Climate. In El Niño Southern Oscillation in a Changing Climate (eds M.J. McPhaden, A. Santoso and W. Cai). *AGU Monograph*, doi:10.1002/9781119548164.ch1.

McPhaden, M.J., T. Lee, S. Fournier, and M.A. Balmaseda, 2021: ENSO Observations. In El Niño Southern Oscillation in a Changing Climate (eds M.J. McPhaden, A. Santoso and W. Cai*). AGU Monograph,* doi:10.1002/9781119548164.ch3.

Nagura, M. and M.J. McPhaden, 2021: Interannual variability in sea surface height at southern mid-latitudes of the Indian Ocean. *J. Phys. Oceanogr., 51*, 1595-1609. https://doi.org/10.1175/JPO-D-20-0279.1.

Nagura, M., and M.J. McPhaden, 2021: Predicting interannual variability in sea surface height along the west coast of Australia using a simple ocean model. *Geophysical Research Letters, 48*, e2021GL094592. https://doi.org/10.1029/2021GL094592.

McPhaden, M.J., T. Lee, S. Fournier, and M.A. Balmaseda, 2021: ENSO Observations. In El Niño Southern Oscillation in a Changing Climate (eds M.J. McPhaden, A. Santoso and W. Cai*). AGU Monograph,* doi:10.1002/9781119548164.ch3.

Nagura, M. and M.J. McPhaden, 2021: Interannual variability in sea surface height at southern mid-latitudes of the Indian Ocean. *J. Phys. Oceanogr., 51*, 1595-1609. https://doi.org/10.1175/JPO-D-20-0279.1.

Nagura, M., and M.J. McPhaden, 2021: Predicting interannual variability in sea surface height along the west coast of Australia using a simple ocean model. *Geophysical Research Letters, 48*, e2021GL094592. https://doi.org/10.1029/2021GL094592.

Planton, Y.Y., J. Vialard, E. Guilyardi, M. Lengaigne, and M.J. McPhaden, 2021: The Asymmetric Influence of Ocean Heat Content on ENSO Predictability in the CNRM-CM5 Coupled General Circulation Model. *J. Climate*, 34, 5775-5793. https://doi.org/10.1175/JCLI-D-20-0633.1.

Planton, Y.Y., and co-authors, 2021: Evaluating climate models with the CLIVAR 2020 ENSO metrics package. *Bull. Amer. Meteor. Soc., 102*, E193-E217. https://doi.org/10.1175/BAMS-D-19-0337.1.

Power, S., M. Lengaigne, A. Capotondi, M. Khodri, J. Vialard, B. Jebri, E. Guilyardi, S. McGregor, J.-S. Kug, M. Newman, M. J. McPhaden, G. Meehl, D. Smith, J. Cole, J. Emile-Geay, D. Vimont, A.T. Wittenberg, M. Collins, G.-I. Kim, W. Cai, Y. Okumura, C. Chung, K.M. Cobb, F. Delage, Y.Y. Planton, A. Levine, F. Zhu, J. Sprintall, E. Di Lorenzo, X. Zhang, J.-J. Luo, X. Lin, M. Balmaseda, G.

Pujiana, K., and M.J. McPhaden, 2021: Biweekly mixed Rossby-gravity waves in the equatorial Indian Ocean. *J. Geophys. Res., 126*, e2020JC016840. https://doi.org/10.1029/2020JC016840.

Pujiana, K. and M.J. McPhaden, 2021: Intraseasonal Kelvin waves in the equatorial Indian Ocean and their propagation into the Indonesian Seas. *J. Geophys. Res., 25*. https://doi.org/10.1029/2019JC015839.

Shroyer, E., et al., 2021: Bay of Bengal Intraseasonal Oscillations and the 2018 Monsoon Onset. *Bull. Am. Meteorol. Soc.* https://doi.org/10.1175/BAMS-D-20-0113.1.

Wang, B.J. Henley, 2021: Decadal climate variability in the tropical Pacific: characteristics, causes, predictability and prospects. *Science, 374*, eaay9165. DOI: 10.1126/science.aay9165.

Yu, J-Y., E. Campos, Y. Du, T. Eldevik, S.T. Gille, T. Losada, M.J. McPhaden, and L.H. Smedsrud, 2021: Variability of the Oceans. In: Interacting Climates of Ocean Basins (C.R. Mechoso, Ed.). *Cambridge University Press*, Cambridge, UK, 358pp.

Zhang, L., W. Han, G.A. Meehl, A. Hu, N. Rosenbloom, T. Shinoda, and M.J. McPhaden, 2021: Diverse Impacts of the Indian Ocean Dipole on El Niño-Southern Oscillation. *J. Climate, 34*, 9057-9070. https://journals.ametsoc.org/view/journals/clim/34/22/JCLI-D-21-0085.1.xml.

Beal, L.M., J. Vialard, M.K. Roxy, J. Li, M. Andres, H. Annamalai, M. Feng, W. Han, R. Hood, T. Lee, M. Lengaigne, R. Lumpkin, Y. Masumoto, M.J. McPhaden, M. Ravichandran, T. Shinoda, B.M. Sloyan, P.G. Strutton, A.C. Subramanian, T. Tozuka, C.C. Ummenhofer, A.S. Unnikrishnan, J. Wiggert, L. Yu, L. Cheng, D.G. Desbruyères, and Parvathi, 2020: A roadmap to IndOOS-2: Better observations of the rapidly-warming Indian Ocean. *Bull. Am. Meteorol. Soc., 101*. E1891-E1913. doi:https://doi.org/10.1175/BAMS-D-19-0209.1

Cai, W., M.J. McPhaden, A.M. Grimm, et al., 2020: Climate impacts of the El Niño-Southern Oscillation on South America. *Nat. Rev. Earth Environ., 1*, 215-231. https://doi.org/10.1038/s43017-020-0040-3.

Cai, W., B. Ng, T. Geng, L. Wu, A. Santoso, and M.J. McPhaden, 2020 Butterfly effect and a self-modulating El Niño response to global warming. *Nature, 585*, 68-73. https://doi.org/10.1038/s41586-020-2641-x.

Chikamoto, Y., Z.F. Johnson, S.-Y. Simon Wang, M.J. McPhaden, and T. Mochizuki, 2020: El Niño Southern Oscillation evolution modulated by Atlantic forcing. *J. Geophys. Res., 125*, e2020JC016318. https://doi.org/10.1029/2020JC016318.

Girishkumar, M.S., K. Ashin, M.J. McPhaden, B. Balaji, and B. Praveenkumar, 2020: Estimation of vertical heat diffusivity at the base of the mixed layer in the Bay of Bengal. *J. Geophys. Res*., *125*, e2019JC015402. http://dx.doi.org/10.1029/2019JC015402.

Hu, S., J. Sprintall, C. Guan, M.J. McPhaden, F. Wang, D. Hu, and W. Cai, 2020: Deep-reaching acceleration of global mean ocean circulation over the past two decades, *Sci. Adv., 6*. eaax7727.

Hu, Z.-Z, A. Kumar, B. Huang, J. Zhu, M. L'Heureux, M.J. McPhaden, and J.-Y. Yu, 2020: The Interdecadal Shift of ENSO Properties in 1999/2000: A Review. *J. Climate*, *33*, 4441-4462. https://doi.org/10.1175/JCLI-D-19-0316.1.

Hu, Z.-Z., M.J. McPhaden, A. Kumar, J.-Y. Yu, B. Huang, and N.C. Johnson, 2020: Uncoupled El Niño Warming. *Geophys. Res. Lett., 47*, e2020GL08762. DOI: 10.1029/2020GL087621.

Johnson, Z. F., Y. Chikamoto, S.S. Wang, M.J. McPhaden, and T. Mochizuki, 2020: Pacific decadal oscillation remotely forced by the equatorial Pacific and the Atlantic Oceans. *Clim. Dyn., 55*, 789-811. https://doi.org/10.1007/s00382-020-05295-2.

Joseph, J., M.S. Girishkumar, M.J. McPhaden, and E. Pattabhi Rama Rao, 2020: Diurnal variability of atmospheric cold pool events and associated air-sea interactions in the Bay of Bengal during the summer monsoon. *Clim. Dyn*. *56*, 837-853. https://doi.org/10.1007/s00382-020-05506-w.

Pujiana, K. and M.J. McPhaden, 2020: Intraseasonal Kelvin waves in the equatorial Indian ocean and their propagation into the Indonesian seas. *J. Geophys. Res., 125*, e2019JC015839.

https://doi.org/10.1029/2019JC015839.

Rubino, A., D. Zanchettin, F. De Rovere, and M.J. McPhaden, 2020: On the interchangeability of sea-surface and near-surface air temperature anomalies in climatologies. *Sci. Rept*., *10*, 7433. https://doi.org/10.1038/s41598-020-64167-1.

Bourlès, B.M. Araujo, M.J. McPhaden, P. Brandt, G. Foltz, R. Lumpkin, H. Giordani, F. Hernandez, N. Lefèvre, P. Nobre, E. Campos, R. Saravanan, J. Trotte-Duhà, M. Dengler, J. Hahn, R. Hummels, J. Lübbecke, M. Rouault, L. Cotrim, A. Sutton, M. Jochum, and R. Perez, 2019: PIRATA: A sustained observing system for tropical Atlantic climate research and forecasting. *Earth Space Sci., 6*, 577-616. https://doi.org/10.1029/2018EA000428.

Cai, W.L. Wu, M. Lengaigne, Tim Li, S. McGregor, J.-S. Kug, J.-Y. Yu, M.F. Stuecker, A. Santoso, X. Li, Y.-G. Ham, Y. Chikamoto, B. Ng, M.J. McPhaden, Y. Du, D. Dommenget, F. Jia, J.B. Kajtar, N. Keenlyside, X. Lin, J.-J. Luo, M. Martín del Rey, Y. Ruprich-Robert, G. Wang, S.-P. Xie, Y. Yang, S.M. Kang, J.-Y. Choi, B. Gan, G.-I. Kim, C.-E. Kim, S. Kim, J.-H. Kim, P. Chang, 2019: Pan-tropical climate interactions. *Science*, 363(6430), eaav4236, DOI: 10.1126/science.aav4236.

Cyriac, A., M.J. McPhaden, H.E. Phillips, N.L. Bindoff, and M. Feng, 2019: Seasonal evolution of the surface layer heat balance in the eastern subtropical Indian Ocean. *J. Geophys. Res*., *124*, 6459-6477. https://doi.org/10.1029/2018JC014559.

Davis, R.E., L.D. Talley, D. Roemmich, W.B. Owens, D.L. Rudnick, J. Toole, R. Weller, M.J. McPhaden, and J.A. Barth, 2019: 100 Years of Progress in Ocean Observing Systems. *Am. Meteorol. Soc., Meteorological Monographs, 59*, 3.1-3.46, https://doi.org/10.1175/AMSMONOGRAPHS-D-18-0014.1.

Foltz, G.R., et al, 2019: The Tropical Atlantic Observing System. *Front. Mar. Sci*, doi:10.3389/fmars.2019.00206.

Guan, C., S. Hu, M.J. McPhaden, F. Wang, S. Gao, and Y. Hou, 2019: Dipole structure of mixed layer salinity in response to El Niño-La Niña asymmetry in the tropical Pacific. *Geophys. Res. Lett., 46*. 12,165-12,172. https://doi.org/10.1029/2019GL084817.

Guan, C., M.J. McPhaden, F. Wang, and S. Hu, 2019: Quantifying the role of oceanic feedbacks on ENSO asymmetry. *Geophys. Res. Lett., 46*, 2140-2148. https://doi.org/10.1029/2018GL081332.

Hermes, J.C., et al, 2019: A sustained ocean observing system in the Indian Ocean for climate related scientific knowledge and societal needs. *Front*. *Mar. Sci.,* doi: 10.3389/fmars.2019.00355.

Hu, Z.-Z., B. Huang, J. Zhu, A. Kumar, and M.J. McPhaden, 2019: On the variety of coastal El Niño Events. *Clim. Dyn., 52(12)*, 7537-7552. https://doi.org/10.1007/s00382-018-4290-4.

Lasitha Perera, G., G. Chen, M.J. McPhaden, T. Priyadarshana, K. Huang, and D. Wang, 2019: Meridional and zonal eddy-induced heat and salt transport in the Bay of Bengal and their seasonal modulation. *J. Geophys. Res., 124*. 8079-8101. https://doi.org/10.1029/2019JC015124.

Leung, S., L. Thompson, M.J. McPhaden, and K.A.S. Mislan, 2019: ENSO drives near-surface oxygen and vertical habitat variability in the tropical Pacific. *Environ. Res. Lett*., 14 (6), 064020. https://doi.org/10.1088/1748-9326/ab1c13.

Lim, E.-P., H.H. Hendon, P. Hope, C. Chung, F. Delage, and M.J. McPhaden, 2019: Continuation of tropical Pacific Ocean temperature trend may weaken extreme El Niño and its linkage to the Southern Annular Mode. *Scientific Reports*, *9*, 17044. doi:10.1038/s41598-019-53371-3.

McPhaden, M.J., A. Santoso, and W. Cai, 2019: Understanding ENSO in a Changing Climate. Eos, *Trans. Am. Geophys. Union., 100*, https://doi.org/10.1029/2019EO124159.

Pujiana, K., M.J. McPhaden, A.L. Gordon, and A.M. Napitu, 2019: Unprecedented response of Indonesian throughflow to anomalous Indo-Pacific climatic forcing in 2016. *J. Geophys. Res.,* 124, 3737-3754. https://doi.org/10.1029/2018JC014574.

Puy, M., J. Vialard, M. Lengaigne, E. Guilyardi, A. Voldoire, M. Balmaseda, G. Madec, C. Menkes, and M.J. McPhaden, 2019: Influence of Westerly Wind Events stochasticity of El Niño amplitude: the case of 2014 vs. 2015. *Clim. Dyn., 52*, 7435-7454. DOI:10.1007/s00382-017-3938-9.

Roxy, M.K., P. Dasgupta, M.J. McPhaden, T. Suematsu, C. Zhang, and D. Kim, 2019: Twofold expansion of the Indo-Pacific warm pool warps the MJO life cycle. *Nature, 575*, 647-651. https://doi.org/10.1038/s41586-019-1764-4.

Sutton, A.J., et al., 2019: Autonomous seawater pCO2 and pH time series from 40 surface buoys and the emergence of anthropogenic trends, *Earth Syst. Sci. Data, 11*, 421-439. https://doi.org/10.5194/essd-11-421-2019.

Cai, W., G. Wang, B. Dewitte, L. Wu, A. Santoso, K. Takahashi, Y. Yang, A. Carréric and M.J. McPhaden, 2018: Increased variability of eastern Pacific El Niño under greenhouse warming. *Nature. 564*, 201-206. https://doi.org/10.1038/s41586-018-0776-9.

Dong, L. and M.J. McPhaden, 2018: Unusually warm Indian Ocean sea surface temperatures help to arrest development of El Niño in 2014. *Science Reports, 8*, 2249, doi:10.1038/s41598-018-20294-4.

Huang, K., M.J. McPhaden, W. Wang, Q. Xie, J. Chen, Y. Shu, Q. Wang, J. Li, J. Yao, D. Wang, 2018: Vertical propagation of mid-depth zonal currents associated with surface wind forcing in the equatorial Indian Ocean. *J. Geophys, Res*., *123*, 7290-7307. https://doi.org/10.1029/2018JC013977.

Levine, A.F.Z., D.M.W. Frierson, M.J. McPhaden, 2018: AMO forcing of Multidecadal Pacific ITCZ variability. *J. Climate*, 31, 5749-5764.

McPhaden, M.J., 2018: Understanding and Predicting El Niño and the Southern Oscillation. In: Chassignet, E.P., A. Pascual, J. Tintoré, and J. Verron (Eds.). *New Frontiers in Operational Oceanography. GODAE OceanView, 815pp*, https://doi.org/10.17125/gov2018.

Nagura, M. and M.J. McPhaden, 2018: The Shallow Overturning Circulation in the Indian Ocean, *J. Phys. Oceanogr., 48*, 413-434.

Pujiana, K. and M.J. McPhaden, 2018: Ocean's response to the convectively coupled Kelvin waves in the eastern equatorial Indian Ocean. *J. Geophys. Res*., *123*, 5727-5741. https://doi.org/10.1029/2018JC013858.

Scannell, H.A. and M.J. McPhaden, 2018: Seasonal mixed layer temperature balance in the southeastern tropical Atlantic. *J. Geophys. Res*., *123*, 5557-5570. https://doi.org/10.1029/2018JC014099.

Timmermann, A., et al, 2018: El Niño-Southern Oscillation Complexity. *Nature*, *559*, 535-545. https://doi.org/10.1038/s41586-018-0252-6.

Yeh, S.-W., W. Cai, S.-K. Min, M.J. McPhaden, D. Dommenget, B. Dewitte, M. Collins, K. Ashok, S.-I. An, B.-Y. Yim, and J.-S. Kug, 2018: ENSO atmospheric teleconnections and their response to greenhouse gas forcing. *Rev. Geophys*., *56*, 185-206. doi:10.1002/2017RG000568.

Zhang, Y., M. Feng, Y. Du, H. Philips, N. Bindoff, and M.J. McPhaden, 2018: Strengthened Indonesian Throughflow drives decadal warming in the southern Indian Ocean. *Geophys. Res. Lett*., *45*, 6167-6175. https://doi.org/10.1029/2018GL078265.

Brainard, R.E., T. Oliver, M.J. McPhaden, A. Cohen, R. Veneers, A. Heenan, B. Vargas-Angel, R. Rotjan, S. Mangubhai, E. Flint, and S.A. Hunter, 2017: Ecological Impacts of the 2015-2016 El Niño in the Central

Equatorial Pacific. *Bull. Am. Meteorol. Soc*., *98*, S21 – S26.

Chen, G., W. Han, Y. Li, M.J. McPhaden, J. Chen, W. Wang, and D. Wang, 2017: Strong Intraseasonal Variability of Meridional currents near 5ºN in the Eastern Indian Ocean: Characteristics and Causes. *J. Phys. Oceanogr*. *47*, 979-998.

Cuypers, Y., P. Bouruet-Aubertot, J. Vialard, and M.J. McPhaden, 2017: Focusing of internal tides by near-inertial waves, *Geophys. Res. Lett., 44*, doi:10.1002/2017GL072625.

Dong, L. and M.J. McPhaden, 2017: The effects of external forcing and internal variability on the formation of interhemispheric sea surface temperature gradient trends in the Indian Ocean. *J. Climate*, *30*, 9077- 9095.

Dong, L. and M.J. McPhaden, 2017: Why has the relationship between Indian and Pacific Ocean decadal variability changed in recent decades? *J. Climate, 30,* 1971-1983.

Dong, L. and M.J. McPhaden, 2017: The role of external forcing and internal variability in regulating global mean surface temperatures on decadal timescales. *Environ. Res. Lett*., *12,* 034011. https://doi.org/10.1088/1748-9326/aa5dd8.

Girishkumar, M.S., J. Joseph, V.P. Thangaprakash, P. Vijay and M.J. McPhaden, 2017: Mixed layer temperature budget for the northward propagating summer monsoon intraseasonal oscillation (MISO) in the central Bay of Bengal. *J. Geophys. Res*., *122*, 8841-8854. https://doi.org/10.1002/2017JC013073.

Khodri, M., T. Izumo, J. Vialard, C. Cassou, M. Lengaigne, J. Mignot, E. Guilyardi, N. Lebas, Y. Ruprich-Robert, A. Robock, and M.J. McPhaden, 2017. How tropical explosive volcanic eruptions trigger El Niño events by cooling tropical Africa. *Nature Comm*., 8, doi:10.1038/s41467-017-00755-6.

Levine, A.F.Z., M.J. McPhaden, and D.M.W. Frierson, 2017: The impact of the AMO on multidecadal ENSO variability. *Geophys. Res. Lett., 44*, 3,877-3,886, doi:10.1002/2017GL072524.

Lübbecke, J.F., and M.J. McPhaden, 2017: Symmetry of the Atlantic Niño mode, *Geophys. Res. Lett., 44*, 965-973, doi:10.1002/2016GL071829.

McGregor, S., A. Sen Gupta, D. Dommenget, T. Lee, M.J. McPhaden, and W.S. Kessler, 2017: Factors influencing the skill of synthesized satellite wind products in the tropical Pacific. *J. Geophys. Res. Oceans*, *122,* doi:10.1002/2016JC012340.

Santoso, A., M.J. McPhaden, W. Cai, 2017: The defining characteristics of ENSO extremes and the strong 2015/16 El Niño. *Rev. Geophys*., 55, 1079-1129. https://doi.org/10.1002/2017RG000560.

Wang, G., W. Cai, B. Gan, L. Wu, A. Santoso, X. Lin, Z. Chen and M. J. McPhaden, 2017: Continued increase of extreme El Niño frequency long after 1.5°C warming stabilization. *Nature Climate Change*, DOI: 10.1038/NCLIMATE3351.

Wang, Y. and M.J. McPhaden, 2017: Seasonal Cycle of Cross-Equatorial Flow in the Central Indian Ocean. *J. Geophys. Res*., *122*, 3817-3827, doi:10.1002/2016JC012537.

Dong, L. and M.J. McPhaden, 2016: Interhemispheric SST gradient trends in the Indian Ocean prior to and during the recent global warming hiatus. *J. Climate*, *29*, 9077-9095.

Guan, C. and M.J. McPhaden, 2016: Ocean processes affecting the 21th century shift in ENSO SST variability. *J. Climate*, 29, 6861-6879.

Levine, A.F.Z., F.F. Jin, M.J. McPhaden, 2016: Extreme Noise-Extreme El Niño: How State-Dependent Noise Forcing Creates El Niño-La Niña Asymmetry. *J. Climate*, 29, 5483-5499. DOI: http://dx.doi.org/10.1175/JCLI-D-16-0091.1

Levine, A.F.Z. and M.J. McPhaden, 2016: How the July 2014 Easterly Wind Burst Gave the 2015-6 El Niño a Head Start. *Geophys. Res. Lett*., 43, 6503-6510. DOI:10.1002/2016GL069204.

Nagura, M. and M.J. McPhaden, 2016: Zonal propagation of near surface zonal currents in relation to surface wind forcing in the equatorial Indian Ocean. *J. Phys. Oceanogr*., *46*, 3623-3638.

Sutton, A.J., C.L. Sabine, R.A. Feely, W.-J. Cai, M.F. Cronin, M.J. McPhaden, J.M. Morell, J.A. Newton, J.-H. Noh, S.R. Ólafsdóttir, J.E. Salisbury, U. Send, D.C. Vandemark, 2016: Using present-day

observations to detect when anthropogenic change forces surface ocean carbonate chemistry outside pre-industrial bounds. *Biogeosci*., *13*, 5065-5083, doi:10.5194/bg-13-5065-2016.

Wenegrat, J.O. and M.J. McPhaden, 2016: A simple analytical model of the diurnal Ekman layer. *J. Phys. Oceanogr*., *46*, 2877-2894.

Wenegrat, J.O. and M.J. McPhaden, 2016: Wind, waves, and fronts: Fricitonal effects in a generalized Ekman model. *J. Phys. Oceanogr., 46*, 371-394.

Amaya, D.J., S.-P. Xie, A.J. Miller, and M.J. McPhaden, 2015: Seasonality of tropical Pacific decadaltrends during the 21st century global warming hiatus. *J. Geophys. Res., 120*, doi:10.1002/2015JC010906.

Cai, W., G. Wang, A. Santoso, M.J. McPhaden, L. Wu, F.-F. Jin, A. Timmermann, M. Collins, G. Vecchi, M. Lengaigne, M.H. England, D. Dommenget, K. Takahashi, and E. Guilyardi, 2015: Increasing frequency of extreme La Niña events induced by greenhouse warming. *Nature Climate Change 5*, 132- 137, doi: 10.1038/nclimate2492.

Cai, W., A. Santoso, G. Wang, S.-W. Yeh, S.-I. An, K. Cobb, M. Collins, E. Guilyardi, F.-F. Jin, J.-S. Kug, M. Lengaigne, M.J. McPhaden, K. Takahashi, A. Timmermann, G. Vecchi, M. Watanabe, L. Wu, 2015: ENSO and global warming. *Nature Climate Change*, 5, 849-859.

Legler, D.M., H.J. Freeland, R. Lumpkin, G. Ball, M.J. McPhaden, S. North, R. Crowley, G.J. Goni, U. Send and M.A. Merrifield, 2015: The current status of the real-time in situ Global Ocean Observing System for operational oceanography. *J. Operational Oceanogr., 8* Suppl. 2, s189-s200.

Levine, A.F.Z., and M.J. McPhaden, 2015: The annual cycle in ENSO growth rate as a cause of the spring predictability barrier. *Geophys. Res. Lett*., *42*, 5034-5041, doi:10.1002/2015GL064309.

McPhaden, M.J. 2015: Playing hide and seek with El Niño. *Nat. Clim Change*, 5, 791-795.

McPhaden, M.J., A. Timmermann, M.J. Widlansky, M.A. Balmaseda and T.N. Stockdale, 2015: The Curious Case of the El Niño that Never Happened: A Perspective from 40 Years of Progress in Climate Research and Forecasting. *Bull. Am. Meteorol. Soc., 96*, 1647-1665.

McPhaden, M.J., Y. Wang, and M. Ravichandran, 2015: Volume transports of the Wyrtki Jets and their Relationship to the Indian Ocean Dipole. *J. Geophys. Res., 120*, 5302-5317, doi:10.1002/2015JC010901.

Strutton, P.G., V.J. Coles, R.R. Hood, R.J. Matear, M.J. McPhaden and H.E. Phillips, 2015: Biogeochemical variability in the equatorial Indian Ocean during the monsoon transition. *Biogeochem., 12*, 2367-2382, doi:10.5194/bg-12-1-2015.

Cai, W., S. Borlace, M. Lengaigne, P. van Rensch, M. Collins, G. Vecchi, A. Timmermann, Santoso, M. J. McPhaden, L. Wu, M. England, E. Guilyardi, and F.-F. Jin, 2014: Increasing frequency of extreme El Niño events due to greenhouse warming. *Nature Climate Change*, *4*, 111–116. doi:10.1038/nclimate2100.

England, M. H., S. McGregor, P. Spence, G. A. Meehl, A. Timmermann, W. Cai, A. Sen Gupta, M. J. McPhaden, A. Purich, and A. Santoso, 2014: Recently intensified Pacific Ocean wind--driven circulation

and the ongoing warming hiatus, *Nature Climate Change*, *4*, 222–227. doi:10.1038/nclimate2106.

Han, W., J. Vialard, M.J. McPhaden, T. Lee, Y. Masomoto, M. Feng, and W. de Ruijter, 2014: Indian Ocean decadal variability: a review. *Bull. Am. Meteorol. Soc*., *95*, 1679-1703.

Hood, R. R., M. J. McPhaden, and E. Urban, 2014: New Indian Ocean program builds on scientific legacy. *EOS*, *Trans. Am. Geophys. Union*, *95*, 349-60.

Lee, T., G. Lagerloef, H.-Y. Kao, M. J. McPhaden, J. Willis, and M. M. Gierach, 2014: The influence of salinity on tropical Atlantic instability waves and eddies. *J. Geophys. Res*., 41, 7933–7941.

Lübbecke, J. F. and M. J. McPhaden, 2014: Assessing the 21st century shift in ENSO variability in terms of the Bjerknes stability index. *J. Climate*, *27*, 2577-2587, doi: http://dx.doi.org/10.1175/JCLI-D-13-00438.1.

Lübbecke, J. F., N. L. Burls, C. J. C. Reason, and M. J. McPhaden, 2014: Variability in the South Atlantic anticyclone and the Atlantic Niño mode. *J. Climate*, *27*, 8135–8150, doi: http://dx.doi.org/10.1175/JCLI-D-14-00202.1

McPhaden, M. J. and M. Nagura, 2014: Indian Ocean Dipole interpreted in terms of Recharge Oscillator theory. *Clim. Dyn., 42*, 1569–1586, doi 10.1007/s00382-013-1765-1.

Nagura, M. and M. J. McPhaden, 2014: Zonal momentum budget along the equator in the Indian Ocean from a high resolution ocean general circulation model. *J. Geophys. Res*. Oceans, *119*, 4444-4461, doi:10.1002/2014JC009895.

Nyadjro, E. and M. J. McPhaden, 2014: Variability of zonal currents in the eastern equatorial Indian Ocean on seasonal to interannual time scales. *J. Geophys. Res*., *119*, 7969–7986, doi:10.1002/2014JC010380.

Praveen Kumar, B., J. Vialard, M. Lengaigne, V.S.N. Murty, G.R. Foltz, M.J. McPhaden, S. Pous, and C. de Boyer Montégut, 2014: Processes of interannual mixed layer temperature variability in the thermocline ridge of the Indian Ocean. *Clim. Dyn., 43*, 2377-2397, doi:10.1007/s00382-014-2059-y.

Rodrigues, R. R. and M. J. McPhaden, 2014: Why did the 2011-12 La Niña cause a severe drought in the Brazilian Northeast? *Geophys. Res. Lett., 41*, 1012–1018. DOI: 10.1002/2013GL058703.

Servain, J., G. Caniaux, Y. K. Kouadio, M. J. McPhaden, and M. Araujo, 2014: Recent Climatic Trends in the Tropical Atlantic. *Clim. Dyn*., *41*, 3071-3089, doi:10.1007/s00382-014-2168-7.

Sutton, A. J. R. A. Feely, C. L. Sabine, M. J. McPhaden, T. Takahashi, F. P. Chavez, G. E. Friederich, and J. T. Mathis, 2014: Natural variability and anthropogenic change in equatorial Pacific surface ocean pCO2 and pH. *Global Biogeochem. Cycles*, *28*, 131–145, doi:10.1002/2013GB004679.

Wen, C., A. Kumar, Y. Xue, and M. J. McPhaden, 2014: Understanding Causes for Change in ENSO Characteristics after 1999: An oceanic perspective. *J. Climate*, *19*, 7230-7249, http://dx.doi.org/10.1175/JCLI-D-13-00518.1.

Wenegrat, J. O. and M. J. McPhaden, 2014: Dynamics of surface layer diurnal cycle in the equatorial Atlantic Ocean (0°, 23°W), *J. Geophys. Res*., doi: 10.1002/2014JC010504.

Wenegrat, J. O., M. J. McPhaden, and R.-C. Lien, 2014: Wind Stress and Near-Surface Shear in the Equatorial Atlantic Ocean. *Geophys. Res. Lett., 41*, 1226–1231, doi:10.1002/2013GL059149.

Zhang, D., M. J. McPhaden, and T. Lee, 2014: Observed Interannual Variability of Zonal Currents in the Equatorial Indian Ocean Thermocline and Their Relation to Indian Ocean Dipole. *Geophys. Res. Lett*., 41, 7933-7941, doi: 10.1002/2014GL061449.

Cuypers, Y., X. Le Vaillant, P. Bouruet-Aubertot, J. Vialard and M. J. McPhaden, 2013: Tropical storm-induced near-inertial internal waves during the Cirene experiment: energy fluxes and impact on vertical mixing. *J. Geophys. Res., 118,* 358-380, doi: 10.1029/2012JC007881.

Feng, M., M. J. McPhaden, S.-P. Xie, and J. Hafner, 2013: La Niña forces unprecedented Leeuwin Current warming in 2011. *Nature Sci. Repts., 3, 1277,* doi 10.1038/srep01277.

Foltz, G. R., A. T. Evan, H. P. Freitag, S. Brown, and M. J. McPhaden, 2013: Dust accumulation biases in PIRATA shortwave radiation records. *J. Atmos. Ocean. Tech. 30,* 1414-1432*,* doi: 10.1175/JTECH-D- 12-00169.1.

Girishkumar, M. S., M. Ravichandran and M. J. McPhaden, 2013: Temperature inversions and their influence on the mixed layer heat budget during the winters of 2006-07 and 2007-08 in the Bay of Bengal. *J. Geophys. Res., 118,* doi:10.1002/jgrc.20192.

Luebbecke, J. and M. J. McPhaden, 2013: A comparative stability analysis of Atlantic and Pacific Niño modes. *J. Climate, 26,* 5965-5980, doi:10.1175/JCLI-D-12-00758.1.

McGregor, S., N. Ramesh, P. Spence, M. H. England, M. J. McPhaden, and A. Santoso, 2013: Meridional movement of wind anomalies during ENSO events and their role in event termination, *Geophys. Res. Lett., 40,* doi:10.1002/grl.50136.

McPhaden, M. J., and G. R. Foltz, 2013: Intraseasonal variations in the surface layer heat balance of the central equatorial Indian Ocean: The importance of zonal advection and vertical mixing. Geophys. Res. Lett., 40, 1-5, doi:10.1029/GL056092.

Moum, J. N., A. Perlin, J. D. Nash, and M. J. McPhaden, 2013: Ocean mixing controls seasonal sea surface cooling in the equatorial Pacific cold tongue. *Nature, 500,* 64-67.

Praveen Kumar, B., J. Vialard, M. Lengaigne, V.S.N. Murty, M.J. McPhaden, M.F. Cronin, F. Pinsard and K. Gopala Reddy, 2013: TropFlux wind stresses over the tropical oceans: evaluation and comparison with other products. *Clim. Dynamics*, 40, 2049-2071, doi: 10.1007/s00382-012-1455-4.

Santoso, A., S. McGregor, F.-F. Jin, W. Cai, M. H. England, S.-I. An, M. J. McPhaden, and E. Guilyardi, 2013: Late 20 Century Emergence of El Niño Propagation Asymmetry and Future Projections. Nature, 504, 126-130.

Bingham, F. M., G. R. Foltz, and M. J. McPhaden, 2012: Characteristics of the seasonal cycle of surface layer salinity in the global ocean. *Ocean Science, 8,* 915-929.

Cai, W., M. Lengaigne, S. Borlace, M. Collins, T. Cowan, M. J. McPhaden, A. Timmermann, S. Power, J. Brown, C. Menkes, A. Ngari, E. M. Vincent, and M. Widlansky, 2012: More extreme swings of the South Pacific Convergence Zone due to greenhouse warming. *Nature, 488,* 365-370.

Foltz, G.R., M.J. McPhaden, and R. Lumpkin, 2012: A strong Atlantic Meridional Mode event in 2009: The role of mixed layer dynamics. *J. Climate, 25,* 363-380, doi:10.1175/JCLI-D-11-00150.1.

Gierach, M. M, T. Lee, D. Turk, and M. J. McPhaden, 2012: Biological Response to the 1997-98 and 2009- 10 El Niño events in the Equatorial Pacific Ocean. *Geophys. Res. Lett., 39,* L10602, doi:10.1029/2012GL051103.

Gnanaseelan, C., A. Deshpande, and M. J. McPhaden, 2012: Impact of Indian Ocean Dipole and El Niño/Southern Oscillation forcing on the Wyrtki jets. *J. Geophys. Res., 117,* C08005, doi:10.1029/2012JC007918.

Luebbecke, J. and M. J. McPhaden, 2012: On the inconsistent relationship between Atlantic and Pacific Niños.

J. Climate, 25, 4294-4303.

Maneesha, K., V. S. N. Murty, M. Ravichandran, T. Lee, Weidong Yu, and M. J. McPhaden, 2012: Upper ocean variability in the Bay of Bengal during the tropical cyclones Nargis and Laila. *Prog. Oceanogr., 106,* 49-61.

McPhaden, M. J., 2012: A 21st Century Shift in the Relationship between ENSO SST and Warm Water Volume Anomalies. *Geophys. Res. Lett., 39,* L09706, doi:10.1029/2012GL051826.

Morrissey, M. L., H. J. Diamond, M. J. McPhaden, H. P. Freitag, and J. S. Greene, 2012: An Investigation of the Consistency of TAO/TRITON Buoy-mounted Capacitance Rain Gauges. *J. Atmos. Ocean. Tech., 29,* 834-845, doi: 10.1175/JTECH-D-11-00171.1.

Nagura, M., and M. J. McPhaden, 2012: The dynamics of wind-driven intraseasonal variability in the equatorial Indian Ocean, *J. Geophys. Res., 115,* C07009, doi:10.1029/2011JC007405.

Praveen Kumar, B., J. Vialard, M. Lengaigne, V.S.N. Murty and M.J. McPhaden, 2012: TropFlux: Air-Sea Fluxes for the Global Tropical Oceans: Description and evaluation. *Clim. Dynamics, 38,* 1521-1543, doi:10.1007/s00382-011-1115-0.

Wu, L., W. Cai, L. Zhang, H. Nakamura, A. Timmermann, T. Joyce, M. J. McPhaden, M. Alexander, B. Qiu, M. Visbeck, P. Chang, and B. Giese, 2012: Enhanced Warming over the Global Subtropical Western Boundary Currents. *Nature Climate Change, 2,* 161–166, doi: 10.1038/NCLIMATE1353.

Delcroix T., G. Alory, S. Cravatte, T. Corrége, and M. J. McPhaden, 2011: A gridded sea surface salinity data set for the tropical Pacific with sample applications (1950-2008). *Deep-Sea Res.* Part I, 58, 38-48.

Girishkumar, M. S., M. Ravichandran, M. J. McPhaden, and R. R. Rao, 2011: Intraseasonal variability in barrier layer thickness in the south central Bay of Bengal, *J. Geophys. Res., 116,* C03009, doi:10.1029/2010JC006657.

Iskandar, I., and M. J. McPhaden, 2011: Dynamics of wind-forced intraseasonal zonal current variations in the equatorial Indian Ocean, *J. Geophys. Res., 116,* C06019, doi:10.1029/2010JC006864.

McPhaden, M. J., T. Lee, and D. McClurg, 2011: El Niño and its relationship to changing background conditions in the tropical Pacific. *Geophys. Res. Lett., 38,* L15709, doi:10.1029/2011GL048275.

Turk, D., C. S. Meinen, D. Antoine, M. J. McPhaden, and M. R. Lewis, 2011: Implications of changing El Niño patterns for biological dynamics in the equatorial Pacific Ocean. *Geophys. Res. Lett., 38,* L23603, doi: 10.1029/2011GL049674.

Yu, L. and M. J. McPhaden, 2011: Ocean pre-conditioning of Cyclone Nargis in the Bay of Bengal: Interaction between Rossby waves, surface fresh waters, and sea surface temperatures. *J. Phys. Oceanogr., 41,* 1741-1755.

Zhang, D., R. Msadek, M. J. McPhaden, and T. Delworth, 2011: Multidecadal variability of the North Brazil Current and its connection to the Atlantic Meridional Overturning Circulation. *J. Geophys. Res., 116,* C04012, doi:10.1029/2010JC006812.

Balmaseda, M.A., Y. Fujii, O. Alves, T. Lee, M. Rienecker, T. Rosati, D. Stammer, Y. Xue, H. Freeland, M.J. McPhaden, L. Goddard, and C. Coelho, 2010: Role of the Ocean Observing System in an end-to- end seasonal forecasting system. In *Proceedings of the "OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 1)*, Venice, Italy, 21–25 September 2009, Hall, J., D.E. Harrison, and D. Stammer, Eds., ESA Publication WPP-306.

Bingham, F., G. R. Foltz, and M. J. McPhaden, 2010: Seasonal Cycles of Surface Layer Salinity in the Pacific

Ocean. *Ocean Sci., 6,* 775-787.

Chang, Y.-T., T. Yung Tang, S.-Y. Chao, M.-H. Chang, D. S. Ko, Y. J. Yang, W.-D. Liang, and M. J. McPhaden, 2010: Mooring observations and numerical modeling of thermal structures in the South China Sea, *J. Geophys. Res., 115*, C10022, doi:10.1029/2010JC006293.

Feng, M., M. J. McPhaden, and T. Lee, 2010: Decadal variability of the Pacific subtropical cells and their influence on the southeast Indian Ocean. *Geophys. Res. Lett., 37,* L09606, doi:10.1029/2010GL042796.

Foltz, G. R., and M. J. McPhaden, 2010: Abrupt equatorial wave-induced cooling of the Atlantic cold tongue in 2009. *Geophys. Res. Lett., 37,* L24605, doi:10.1029/2010GL045522.

Foltz, G. R., and M. J. McPhaden, 2010: Interaction between the Atlantic meridional and Nino modes. *Geophys. Res. Lett.,* L18604, doi:10.1029/2010GL044001. Foltz, G. R., J. Vialard, P. Kumar, and M. J. McPhaden, 2010: Seasonal mixed layer heat balance of the southwestern tropical Indian Ocean. *J. Climate, 23*, 947-965.

Gulev, S.K., S.A. Josey, M. Bourassa, L.-A. Breivik, M.F. Cronin, C. Fairall, S. Gille, E.C. Kent, C.M. Lee, M.J. McPhaden, P.M.S. Monteiro, U. Schuster, S.R. Smith, K.E. Trenberth, D. Wallace, and S.D. Woodruff, 2010: Surface Energy and CO_2 fluxes in the global ocean-atmosphere-ice system. In *Proceedings of the "OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 1)*, Venice, Italy, 21–25 September 2009, Hall, J., D.E. Harrison, and D. Stammer, Eds., ESA Publication WPP-306.

Huang, B., Y. Xue, D. Zhang, A. Kumar, and M. J. McPhaden, 2010: The NCEP GODAS Ocean Analysis of the Tropical Pacific Mixed Layer Heat Budget on Seasonal to Interannual Time Scales. *J. Climate, 23,* 4901-4925.

Lampitt, R. S., P. Favali, C. R. Barnees, M. J. Church, M. F. Cronin, K. L. Hill, Y. Kaneda, D. M. Karl, A. H. Knap, M. J. McPhaden, K. A. Nittis, I. G. Priede, J.-F. Rolin, U. Send, C.-C. Teng, T. W. Trull, D. W.

R. Wallace, R. A. Weller, 2010: In situ sustained Eulerian observatories. In *Proceedings of the "OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 1),* Venice, Italy, 21-25 September 2009, Hall, J. Harrison, D. E., and Stammer, D., Eds., ESA Publication WPP-306.

Lee, T., and M. J. McPhaden, 2010: Increasing intensity of El Niño in the central-equatorial Pacific. *Geophys. Res. Lett., 37,* L14603, doi:10.1029/2010GL044007.

Masumoto, Y., W. Yu, G. Meyers, N. D'Adamo, L. Beal, W.P.M. de Ruijter, M. Dyoulgerov, J. Hermes, T. Lee, J.R.E. Lutjeharms, J.P. McCreary, Jr., M.J. McPhaden, V.S.N. Murty, D. Obura, C.B. Pattiaratchi,

M. Ravichandran, C. Reason, F. Syamsudin, G. Vecchi, J. Vialard, and L. Yu, 2010: Observing systems in the Indian Ocean. In Proceedings of the *"OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 2),* Venice, Italy, 21–25 September 2009, Hall, J., D.E. Harrison, and D. Stammer, Eds., ESA Publication WPP-306, doi: 10.5270/OceanObs09.cwp.60.

McPhaden, M.J., K. Ando, B. Bourlès, H.P. Freitag, R. Lumpkin, Y. Masumoto, V.S.N. Murty, P. Nobre, M. Ravichandran, J. Vialard, D. Vousden, and W. Yu, 2010: The global tropical moored buoy array. In *Proceedings of the "OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 2)*, Venice, Italy, 21–25 September 2009, Hall, J., D.E. Harrison, and D. Stammer, Eds., ESA Publication WPP-306. doi: 10.5270/OceanObs09.cwp.61.

McPhaden, M. J., A. J. Busalacchi, and D. L. T. Anderson, 2010: A TOGA retrospective. *Oceanography, 23,* 86-103.

Nagura, M., and M. J. McPhaden, 2010: Wyrtki Jet dynamics: Seasonal variability, *J. Geophys. Res., 115,*

C07009, doi:10.1029/2009JC005922.

Nagura, M. and M. J. McPhaden, 2010: Dynamics of zonal current variations associated with the Indian Ocean dipole. *J. Geophys. Res., 115,* C11026, doi:10.1029/2010JC006423.

Radenac, M.-H, P. E. Plimpton, A. Lebourges-Dhaussy, L. Commien, and M. J. McPhaden, 2010: Impact of environmental forcing on the acoustic backscattering strength in the equatorial Pacific: diurnal, lunar, intraseasonal, and interannual variability. *Deep-Sea Res., 57,* 1314-1328.

Rienecker, M.M., T. Awaji, M. Balmaseda, B. Barnier, D. Behringer, M. Bell, M. Bourassa, P. Brasseur, J. Carton, J. Cummings, L.-A. Breivik, E. Dombrowsky, C. Fairall, N. Ferry, G. Forget, H. Freeland, S.M. Griffies, K. Haines, D.E. Harrison, P. Heimbach, M. Kamachi, E. Kent, T. Lee, P.-Y. Le Traon, M. McPhaden, M.J. Martin, P. Oke, M.D. Palmer, E. Remy, T. Rosati, A. Schiller, D.M. Smith, D. Snowden, D. Stammer, K.E. Trenberth, and Y. Xue, 2010: Synthesis and assimilation systems— Essential adjuncts to the Global Ocean Observing System. In *Proceedings of the "OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 1)*, Venice, Italy, 21–25 September 2009, Hall, J., D.E. Harrison, and D. Stammer, Eds., ESA Publication WPP-306.

Send, U., R. A. Weller, D. Wallace, F. Chavez, R. Lampitt, T. Dickey, M. Honda, K. Nittis, R. Lukas, M. McPhaden, and R. Feely, 2010: OceanSITES. In Proceedings of the *"OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 2),* Venice, Italy, 21–25 September 2009, Hall, J., D.E. Harrison, and D. Stammer, Eds., ESA Publication WPP-306, doi:10.5270/OceanObs09.cwp.79.

Xue, Y., O. Alves, M.A. Balmaseda, N. Ferry, S. Good, I. Ishikawa, T. Lee, M.J. McPhaden, K.A. Peterson, and M. Rienecker, 2010: Ocean state estimation for global ocean monitoring: ENSO and beyond ENSO. In *Proceedings of the "OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 2)*, Venice, Italy, 21–25 September 2009, Hall, J., D.E. Harrison, and D. Stammer, Eds., ESA Publication WPP-306.

Zhang, X. and M.J. McPhaden, 2010: Interannual surface layer heat balance in the eastern equatorial Pacific and its relationship with local atmospheric forcing. *J. Climate, 23,* 4375–4394.

Clarke, C., et al, 2009: An overview of global ocean observing Systems relevant to GODAE. *Oceanography, 22*, 22-33.

Cravatte, S.E., T. Delcroix, D. Zhang, M.J McPhaden, and J. Leloup, 2009: Observed freshening and warming of the western Pacific warm pool. *Clim. Dyn., 33,* 565-589.

Foltz, G.R., and M.J. McPhaden, 2009: Impact of barrier layer thickness on SST in the central tropical North Atlantic. *J. Climate, 22,* 285-299.

McPhaden, M.J., G.R. Foltz, T. Lee, V.S.N. Murty, M. Ravichandran, G.A. Vecchi, J. Vialard, J.D. Wiggert, L. Yu, 2009: Ocean-Atmosphere Interactions During Cyclone Nargis. *EOS, Trans. Am. Geophys. Union, 90,* 53-54.

McPhaden, M.J., G. Meyers, K. Ando, Y. Masumoto, V.S.N. Murty, M. Ravichandran, F. Syamsudin, J. Vialard, L. Yu, and W. Yu, 2009: RAMA: The Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction. *Bull. Am. Meteorol. Soc.,* 90, 459-480.

McPhaden, M. J., and X. Zhang, 2009: Asymmetry in zonal phase propagation of ENSO sea surface temperature anomalies, *Geophys. Res. Lett., 36,* L13703, doi:10.1029/2009GL038774.

Vialard, J., J.P. Duvel, M. McPhaden, P. Bouruet-Aubertot, B. Ward, E. Key, D. Bourras, R. Weller, P. Minnett, A. Weill, C. Cassou, L. Eymard, T. Fristedt, C. Basdevant, Y. Dandoneau, O. Duteil, T. Izumo, C. de Boyer Montégut, S. Masson, and F. Marsac, 2009: Cirene: Air-sea interactions in the Seychelles-

Chagos thermocline ridge region. *Bull. Am. Meteorol. Soc., 90,* 45-61.

Bourlès, B., R. Lumpkin, M.J. McPhaden, F. Hernandez, P. Nobre, E. Campos, L. Yu, S. Planton, A. Busalacchi, A.D. Moura, J. Servain, and J. Trotte, 2008: The PIRATA Program: History, Accomplishments, and Future Directions. *Bull. Amer. Meteor. Soc., 89*, 1111-1125.

Foltz, G.R., and M.J. McPhaden, 2008: Impact of Saharan dust on tropical North Atlantic SST. *J. Climate, 21,* 5048-5060.

Foltz, G.R., and M.J. McPhaden, 2008: Trends in Saharan dust and tropical Atlantic climate during 1980-2006. *Geophys. Res. Lett., 35,* L20706, doi:10.1029/2008GL035042.

Foltz, G.R. and M.J. McPhaden, 2008: Seasonal mixed layer salinity balance of the tropical North Atlantic Ocean. *J. Geophys. Res. 113,* C02013, doi:10.1029/2007JC004178.

Lee, T. and M.J. McPhaden, 2008: Decadal phase change in large-scale sea level and winds in the Indo-Pacific region at the end of the 20th century. *Geophys. Res. Lett., 35,* L01605, doi:10.1029/2007GL032419.

McPhaden, M.J., 2008: Evolution of the 2006-07 El Niño: The Role of Intraseasonal to Interannual Time Scale Dynamics. *Adv. Geosci., 14,* 219-230.

McPhaden, M.J., M.F. Cronin, and D.C. McClurg, 2008: Meridional structure of the surface mixed layer temperature balance on seasonal time scales in the eastern tropical Pacific. *J. Climate, 21,* 3240-3260.

Nagura, M. and M.J. McPhaden, 2008: The dynamics of zonal current variations in the central equatorial Indian Ocean. *Geophys. Res. Lett., 35,* K23603, doi:10.1029/2008GL035961.

Vialard, J., G. Foltz, M.J. McPhaden, J.P. Duvel and C. de Boyer Montégut, 2008: Strong Indian Ocean sea surface temperature signals associated with the Madden-Julian oscillation in late 2007 and early 2008. *Geophys. Res. Lett., 35,* L19608, doi:10.1029/2008GL035238.

Yoneyama, K., et al, 2008: MISMO field experiment in the tropical Indian Ocean. *Bull. Am. Meteor. Soc., 89,* 1889-1903.

Zhang, X. and M.J. McPhaden, 2008: Eastern equatorial Pacific forcing of ENSO sea surface temperature anomalies. *J. Climate, 21,* 6070-6079.

Cheng, W., M.J. McPhaden, D. Zhang, and E.J. Metzger, 2007: Recent changes in the Pacific subtropical cells inferred from an eddy resolving ocean circulation model. *J. Phys. Oceanogr.*, *37*, 1340-1356.

Delcroix. T., S. Cravatte, and M.J. McPhaden, 2007: Decadal variations and trends in tropical Pacific sea surface salinity since 1970. *J. Geophys. Res., 112*(C3), C03012, doi:10.1029/2006JC003801.

Behrenfeld, M.J., K. Worthington, R.M. Sherrell, F.P. Chavez, P. Strutton, M.J. McPhaden, and D.M. Shea, 2006: Controls on tropical Pacific Ocean productivity revealed through nutrient stress diagnostics. *Nature, 442,* 1025-1028.

Bennett, A.F., B.S. Chua, H.-E. Ngodock, D.E. Harrison, and M.J. McPhaden, 2006: Generalized inversion of the Gent-Cane model of the Tropical Pacific with Tropical Atmosphere-Ocean (TAO) data. *J. Mar. Res., 64*, 1-42.

Cronin, M.F., C. Fairall, and M.J. McPhaden, 2006: An assessment of buoy derived and numerical weather prediction surface heat fluxes in the tropical Pacific. *J. Geophys. Res., 111,* C06038, doi:10.1029/2005JC003324.

Feely, R.A., T. Takahashi, R. Wanninkhof, M.J. McPhaden, C.E. Cosca, S.C. Sutherland and M.-E. Carr,

2006: Decadal Variability of the Air-Sea CO_2 Fluxes in the Equatorial Pacific Ocean. *J. Geophys. Res., 111.*, C08S90, doi:101029/2005JC003129.

Foltz, G.R. and M.J. McPhaden, 2006: Unusually warm sea surface temperatures in the tropical North Atlantic during 2005. *Geophys. Res. Lett., 33,* L19703, doi:10.1029/2006GL027394.

Foltz, G.R. and M.J. McPhaden, 2006: The role of oceanic heat advection in the evolution of tropical North and South Atlantic SST anomalies. *J. Climate, 19,* 6122-6138.

Maes, C., K. Ando, T. Delcroix, W.S. Kessler, M.J. McPhaden, and D. Roemmich, 2006: Observed correlation of surface salinity, temperature and barrier layer at the eastern edge of the western Pacific warm pool. *Geophys. Res. Lett., 33,* L06601, doi:10.1029/2005GL024772.

McPhaden, M.J., S.E. Zebiak, and M.H. Glantz, 2006: ENSO as an integrating concept in Earth science. *Science, 314,* 1740-1745.

McPhaden, M.J., X. Zhang, H.H. Hendon, and M.C. Wheeler, 2006: Large Scale Dynamics and MJO Forcing of ENSO Variability. *Geophys. Res. Lett., 33*(16), L16702, doi:10.1029/2006GL026786.

Schein, K.A. et al, 2006: The state of the climate 2005. *Bull. Am. Meteorol. Soc., 87,* S1-S102.

Zhang, D., and M.J. McPhaden, 2006: Decadal variability of the shallow Pacific meridional overturning circulation: relation to tropical sea surface temperatures in observations and climate change models. *Ocean Modelling, 15*, 250-273.

Zhang, X. and M.J. McPhaden, 2006: Wind stress variations and interannual sea surface temperature anomalies in the eastern equatorial Pacific. *J. Climate, 19,* 226-241.

Capotondi, A., M.A. Alexander, C. Deser, and M.J. McPhaden, 2005: Anatomy and Decadal Evolution of the Pacific Subtropical-Tropical Cells (STCs). *J. Climate, 18*, 3739-3758.

Delcroix, T., M.J. McPhaden, A. Dessier, and Y. Gouriou, 2005: Time and space scales for sea surface salinity in the tropical oceans. *Deep-Sea Res., 52*, 787-813.

Foltz, G.R. and M.J. McPhaden, 2005: Mixed layer heat balance on intraseasonal time scales in the northwestern tropical Atlantic Ocean. *J. Climate, 18,* 4168-4184.

Grodsky, S.A., J.A. Carton, C. Provost, J. Servain, J. A. Lorenzzetti, and M.J. McPhaden, 2005: Tropical instability waves at 0°N, 23°W in the Atlantic: A case study using Pilot Research Moored Array in the Tropical Atlantic (PIRATA) mooring data. *J. Geophys. Res., 110*, C08010, doi:10.1029/2005JC002941.

Levinson, D.H. et al, 2005: State of the Climate in 2004. *Bull. Am. Meteor. Soc., 86*(6), S1-S86.

Cai, W. M.J. McPhaden, and M.A. Collier, 2004: Multidecadal fluctuations in the relationship between equatorial Pacific heat content anomalies and ENSO amplitude. *Geophys. Res. Lett., 31*, L01201, doi:10.1029/2003GL018714.

Foltz, G.R., S.A. Grodsky, J.A. Carton, and M.J. McPhaden, 2004: Seasonal salt budget of the northwestern tropical Atlantic Ocean along 38°W. *J. Geophys. Res., 109*(C3), C03052, doi:10.1029/2003JC002111.

Foltz, G.R. and M.J. McPhaden, 2004: 30-70 day oscillations in the tropical Atlantic. *Geophys. Res. Lett., 31*, L15205, doi:10.1029/2004GL020023.

McPhaden, M.J., 2004: Evolution of the 2002–03 El Niño. *Bull. Am. Meteor. Soc., 85*, 677–695. McPhaden, M.J. and D. Zhang, 2004: Pacific Ocean circulation rebounds. *Geophys. Res. Lett., 31*, L18301, doi:10.1029/2004GL020727.

Rajeevan, M. and M.J. McPhaden, 2004: Tropical Pacific upper ocean heat content variations and Indian summer monsoon rainfall. *Geophys. Res. Lett., 31*, L18203, doi:10.1029/2004GL020631.

Serra, Y. and M.J. McPhaden, 2004: In situ observations of the diurnal variability in rainfall over the tropical Atlantic and Pacific Oceans. *J. Climate, 17*, 3496–3509.

Cosca, C.E., R.A. Feely, R. Wanninkhof, J. Boutin, J. Etcheto, and M.J. McPhaden, 2003: Seasonal and interannual variations of fCO_2-SST relationships for the central and eastern equatorial Pacific. *J. Geophys. Res., 108*(C8), 3278, doi:10.1029/2000JC000677.

Foltz, G.R., S.A. Grodsky, J.A. Carton, and M.J. McPhaden, 2003: Seasonal mixed layer heat budget of the tropical Atlantic Ocean. *J. Geophys. Res., 108*(C5), 3146, doi:10.1029/2002JC001584.

McPhaden, M.J., 2003: Tropical Pacific Ocean heat content variations and ENSO persistence barriers. *Geophys. Res. Lett., 30*(9), 1480, doi:10.1029/2003GL016872.

Scavia, D., M.P. Sissenwine, H.L. Dantzler, M.J. McPhaden, P.F. Moersdorf, 2003: NOAA=s ocean observing programs. *Oceanography, 16,* 61–67.

Serra, Y.L and M.J. McPhaden, 2003: Multiple time space comparisons of ATLAS buoy rain gauge measurements to TRMM satellite precipitation measurements. *J. Appl. Meteorol., 42*, 1045–1059.

Zhang, D., M.J. McPhaden, and W.E. Johns, 2003: Observational evidence for flow between the subtropical and tropical Atlantic: The Atlantic subtropical cells. *J. Phys. Oceanogr., 33,* 1783–1797.

Cronin, M.F. and M.J. McPhaden, 2002: Barrier layer formation during westerly wind bursts. *J. Geophys. Res., 107*(C12), 8020, doi:10.1029/2001JC001171.

Cronin, M.F., N. Bond, C. Fairall, J. Hare, M.J. McPhaden, and R.A. Weller, 2002: Enhanced Oceanic and Atmospheric Monitoring for the Eastern Pacific. *Eos Trans. AGU, 83*, 205.

Delcroix, T. and M.J. McPhaden, 2002: Interannual sea surface salinity and temperature changes in the western Pacific warm pool during 1992–2000. *J. Geophys. Res., 107*(C12), 8002, doi:10.1029/2001JC000862.

Feely, R.A., J. Boutin, C.E. Cosca, Y. Dandonneau, J. Etcheto, H.Y. Inoue, M. Ishii, C.L. Quéré, D. Mackey, M.J. McPhaden, N. Metzl, A. Poisson, and R. Wanninkhof, 2002: Seasonal and interannual variability of CO_2 in the equatorial Pacific. *Deep-Sea Res., 49*, 2443–2469.

Kutsuwada, K. and M.J. McPhaden, 2002: Intraseasonal variations in the upper equatorial Pacific Ocean prior to and during the 1997–98 El Niño. *J. Phys. Oceanogr., 32,* 1133–1149.

Lien, R.-C., E.D. D=Asaro, and M.J. McPhaden, 2002: Internal waves and turbulence in the upper central equatorial Pacific: Lagrangian and Eulerian observations. *J. Phys. Oceanogr., 32*, 2619–2639.

Maes, C., M.J. McPhaden, and D. Behringer, 2002: Signatures of salinity variability in tropical Pacific Ocean dynamic height anomalies. *J. Geophys. Res., 107*(C12), 8012, doi:10.1029/2000JC000737.

McPhaden, M.J., 2002: Mixed layer temperature balance on intraseasonal time scales in the equatorial Pacific Ocean. *J. Climate, 15*(18), 2632–2647.

McPhaden, M.J. and D. Zhang, 2002: Slowdown of the meridional overturning circulation in the upper Pacific Ocean. *Nature, 415*, 603–608.

Medavaya, M., D.E. Waliser, R.A. Weller, and M.J. McPhaden, 2002: Assessing ocean buoy shortwave observations using clear-sky model calculations. *J. Geophys. Res., 107*(C2), 3014,

doi:10.1029/2000JC000558.

Thum, N., S.K. Esbensen, D.B. Chelton, and M.J. McPhaden, 2002: Air-sea heat exchange along the Northern Sea surface temperature front in the eastern tropical Pacific. *J. Climate, 15*(23), 3361–3378.

Chelton, D.B., S.K. Esbensen, M.G. Schlax, N. Thum, M.H. Freilich, F.J. Wentz, C.L. Gentemann, M.J. McPhaden, and P.S. Schopf, 2001: Observations of coupling between surface wind stress and sea surface temperature in the eastern tropical Pacific. *J. Climate, 14*, 1479–1498.

Dickinson, S., K.A. Kelly, M.J. Caruso, and M.J. McPhaden, 2001: A note on comparisons between TAO buoy and NASA scatterometer wind vectors. *J. Atmos. Oceanic Technol., 18*, 799–806.

Godfrey, J.S., G.C. Johnson, M.J. McPhaden, G. Reverdin, and S. Wijffels, 2001: The Tropical Ocean Circulation. In: Ocean Circulation and Climate - Observing and Modelling the Global Ocean, G. Siedler, J. Church, and W.J. Gould, eds., *Academic Press*, 215–246.

Johnson, G.C., M.J. McPhaden, and E. Firing, 2001: Equatorial Pacific Ocean horizontal velocity, divergence, and upwelling. *J. Phys. Oceanogr., 31*, 839–849.

Kelly, K.A., S. Dickinson, M.J. McPhaden, and G.C. Johnson, 2001: Ocean currents evident in satellite wind data. *Geophys. Res. lett., 28*, 2469–2472.

McPhaden, M.J., T. Delcroix, K. Hanawa, Y. Kuroda, G. Meyers, J. Picaut, and M. Swenson, 2001: The El Niño/Southern Oscillation (ENSO) Observing System. In: *Observing the Ocean in the 21st Century*. Australian Bureau of Meteorology, Melbourne, Australia, 231–246.

Meinen, C.S. and M.J. McPhaden, 2001: Interannual variability in warm water volume transports in the equatorial Pacific during 1993–1999. *J. Phys. Oceanogr., 31*, 1324–1345.

Meinen, C.S., M.J. McPhaden, and G.C. Johnson, 2001: Vertical velocities and transports in the equatorial Pacific during 1993–1999. *J. Phys. Oceanogr., 31*, 3230–3248.

Nowlin, Jr., M. Briscoe, W.D., N. Smith, M.J. McPhaden, D. Roemmich, P. Chapman, and J.F. Grassle, 2001: Evolution of a sustained ocean observing system. *Bull. Am. Meteorol. Soc., 82,*1368–1376.

Serra, Y.L., P.A Hearn, H.P. Freitag, and M.J. McPhaden, 2001: ATLAS self-siphoning rain gauge error estimates. *J. Atmos. Oceanic Technol., 18*, 1989–2002.

Turk, D., M.J. McPhaden, M.R. Lewis, and A.J. Busalacchi, 2001: Remotely-sensed biological production in the Tropical Pacific during 1992–1999. *Science, 293*, 471–474.

Vialard, J., C. Menkes, J.-P. Boulanger, P. Delecluse, E. Guilyardi, M.J. McPhaden, and G. Madec, 2001: A model study of oceanic mechanisms affecting equatorial Pacific sea surface temperature during the 1997–98 El Niño. *J. Phys. Oceanogr., 31*, 1649–1675.

Wang, W. and M. J. McPhaden, 2001: Surface layer heat balance in the equatorial Pacific Ocean during the 1997–98 El Niño and the 1998–99 La Niña. *J. Climate, 14*, 3393–3407.

Wang, W. and M.J. McPhaden, 2001: What is the mean seasonal cycle of surface heat flux in the equatorial Pacific? *J. Geophys. Res., 106*, 837–857.

Bennett, A.F., B.S. Chua, D.E. Harrison, and M.J. McPhaden, 2000: Generalized inversion of Tropical Atmosphere-Ocean (TAO) data and a coupled model of the tropical Pacific, II: La Niña, error statistics, and array assessment. *J. Climate, 13*, 2770–2785.

Cronin, M.F., M.J. McPhaden, and R.H. Weisberg, 2000: Wind forced reversing currents in the western equatorial Pacific. *J. Phys. Oceanogr., 30*, 657–676.

Johnson, G.C., M.J. McPhaden, G.D. Rowe, and K.E. McTaggart, 2000: Upper equatorial Pacific Ocean current and salinity variability during the 1996–98 El Niño-La Niña cycle. *J. Geophys. Res., 105*, 1037–1053.

Meinen, C.S. and M.J. McPhaden, 2000: Observations of warm water volume changes in the equatorial Pacific and their relationship to El Niño and La Niña. *J. Climate, 13*, 3551–3559.

Nystuen, J.A., M.J. McPhaden, and H.P. Freitag, 2000: Surface measurements of precipitation from an ocean mooring: The underwater acoustic log from the South China Sea. *J. Appl. Meteorol., 39*, 2182–2197.

Wang, W. and M.J. McPhaden, 2000: The surface layer heat balance in the equatorial Pacific Ocean. Part II: Interannual variability. *J. Phys. Oceanogr., 30*, 2989–3008.

Zhang C. and M.J. McPhaden, 2000: Intraseasonal surface cooling in the equatorial western Pacific. *J. Climate, 13*, 2261–2276.

Chavez, F.P., P.G. Strutton, G.E. Friederich, R.A. Feely, G.C. Feldman, D.G. Foley, and M.J. McPhaden, 1999: Biological and chemical response of the equatorial Pacific Ocean to the 1997-1998 El Niño. *Science, 286*, 2126–2131.

Cronin, M.F. and M.J. McPhaden, 1999: Diurnal cycle of rainfall and sea surface salinity in the western Pacific warm pool. *Geophys. Res. Lett., 26*, 3465–3468.

Johnson, G.C. and M.J. McPhaden, 1999: Interior pycnocline flow from the subtropical to the equatorial Pacific Ocean. *J. Phys. Oceanogr., 29*, 3073–3089.

McPhaden, M.J., 1999: Genesis and evolution of the 1997–98 El Niño. *Science, 283*, 950–954.

McPhaden, M.J., 1999: El Niño: The child prodigy of 1997–98. Nature, 398, 559–562.

McPhaden, M.J. and X. Yu, 1999: Equatorial waves and the 1997–98 El Niño. *Geophys. Res. Lett., 26*, 2961–2964.

Wang, W. and M.J. McPhaden, 1999: The surface layer heat balance in the equatorial Pacific Ocean, Part I: Mean seasonal cycle. *J. Phys. Oceanogr., 29*, 1812–1831.

Yu, X. and M.J. McPhaden, 1999: Seasonal variability in the equatorial Pacific. *J. Phys. Oceanogr., 29*, 925–947.

Yu, X. and M.J. McPhaden, 1999: Dynamical analysis of seasonal and interannual variability in the equatorial Pacific. *J. Phys. Oceanogr., 29*, 2350–2369.

Bennett, A.F., B.S. Chua, D.E. Harrison, and M.J. McPhaden, 1998: Generalized inversion of Tropical Atmosphere-Ocean data and a coupled model of the tropical Pacific. *J. Climate, 11*, 1768–1792.

Chavez, F.P., P.G. Strutton, and M.J. McPhaden, 1998: Biological-physical coupling the central equatorial Pacific during the onset of the 1997–98 El Niño. *Geophys. Res. Lett., 25*, 3543–3546.

Cronin, M.F. and M.J. McPhaden, 1998: Upper ocean salinity balance in the western equatorial Pacific. *J. Geophys. Res., 103*, 27,567–27,589.

McPhaden, M.J., A.J. Busalacchi, R. Cheney, J.R. Donguy, K.S. Gage, D. Halpern, M. Ji, P. Julian, G. Meyers, G.T. Mitchum, P.P. Niiler, J. Picaut, R.W. Reynolds, N. Smith, and K. Takeuchi, 1998: The Tropical Ocean-Global Atmosphere (TOGA) observing system: A decade of progress. *J. Geophys. Res., 103*, 14,169–14,240.

Servain, J., A.J. Busalacchi, M.J. McPhaden, A.D. Moura, G. Reverdin, M. Vianna, and S.E. Zebiak, 1998: A

Pilot Research Moored Array in the Tropical Atlantic (PIRATA). *Bull. Am. Meteorol. Soc., 79*(10), 2019–2031.

Ando, K. and M.J. McPhaden, 1997: Variability of surface layer hydrography in the tropical Pacific Ocean. *J. Geophys. Res., 102*, 23,063–23,078.

Archer, D., J. Aiken, W. Balch, R. Barber, J. Dunne, P. Flament, W. Gardner, C. Garside, C. Goyet, E. Johnson, D. Kirchman, M. McPhaden, J. Newton, E. Peltzer, L. Welling, J. White, and J. Yoder, 1997: A Meeting Place of Great Ocean Currents: Shipboard Observations of a Convergent Front at 2°N in the Pacific. *Deep-Sea Res., 44*, 1827–1850.

Cronin, M.F. and M.J. McPhaden, 1997: The upper ocean heat balance in the western equatorial Pacific warm pool during September-December 1992. *J. Geophys. Res., 102*, 8533–8553.

Foley, D.G., T.D. Dickey, M.J. McPhaden, R.R. Bidigare, M.R. Lewis, R.T. Batber, S.T. Lindley, C. Garside, D.V. Manov, and J.D. McNeil, 1997: Time series of physical, bio-optical, and geochemical properties in the central equatorial Pacific Ocean at 0°,140°W February 1992–March 1993. *Deep-Sea Res., 44*, 1801–1826.

Gu, D., S.G.H. Philander, and M.J. McPhaden 1997: The seasonal cycle and its modulation in the eastern tropical Pacific Ocean. *J. Phys. Oceanogr., 27*, 2209–2218.

Pinkel, R., M. Merrifield, M.J. McPhaden, J. Picaut, S. Rutledge, D. Siegel, and L. Washburn, 1997: Solitary waves in the western equatorial Pacific Ocean. *Geophys. Res. Lett., 24*, 1603–1606.

Plimpton, P.E., H.P. Freitag, and M.J. McPhaden, 1997: ADCP velocity errors from pelagic fish schooling around equatorial moorings. *J. Atmos. Oceanic Technol., 14*, 1212–1223.

Esbensen, S.K. and M.J. McPhaden, 1996: Enhancement of tropical ocean evaporation and sensible heat flux by atmospheric mesoscale systems. *J. Climate, 9*, 2307–2325.

Kessler, W.S., M.C. Spillane, M.J. McPhaden, and D.E. Harrison, 1996: Scales of variability in the equatorial Pacific inferred from the Tropical Atmosphere-Ocean (TAO) Array. *J. Climate, 9*, 2999–3024.

Lien, R.-C., M.J. McPhaden, and M.C. Gregg, 1996: High-frequency internal waves in the upper central equatorial Pacific and their possible relationship to deep-cycle turbulence. *J. Phys. Oceanogr., 26*, 581–600.

McPhaden, M.J., 1996: Monthly Period Oscillation in the Pacific North Equatorial Countercurrent. *J. Geophys. Res., 101*, 6337–6359.

Nowlin, W.D., N. Smith, G. Needler, P.K. Taylor, R. Weller, R. Schmitt, L. Merlivat, A. Vézina, A. Alexiou, M.J. McPhaden, and M. Wakatsuchi, 1996: An Ocean Observing System for climate. *Bull. Am. Meteorol. Soc., 77*, 2243–2273.

Picaut, J., M. Ioualalen, C. Menkes, T. Delcroix and M.J. McPhaden, 1996: Mechanism of the zonal displacements of the Pacific warm pool: Implications for ENSO. *Science, 274*, 1486–1489.

Bond, N.A. and M.J. McPhaden, 1995: An indirect estimate of the diurnal cycle in upper ocean turbulent heat fluxes at the equator, 140°W. *J. Geophys. Res., 100*, 18,369–18,378.

Katz, E.J., A. Busalacchim M. Bushnell, Frank González, L. Gourdeau, M.J. McPhaden, and J. Picaut, 1995: A comparison of coincidental time series of the ocean surface height by satellite altimeter, mooring, and inverted echo sounder. *J. Geophys. Res., 100*, 25,101–25,108.

Kessler, W.S. and M.J. McPhaden, 1995: The 1991–93 El Niño in the Central Pacific. *Deep-Sea Res., Part II,*

42, 295–333.

Kessler, W.S. and M.J. McPhaden, 1995: Oceanic equatorial waves and the 1991–93 El Niño. *J. Climate, 8*, 1757–1774.

Kessler, W.S., M.J. McPhaden, and K.M. Weickmann, 1995: Forcing of intraseasonal Kelvin Waves in the equatorial Pacific. *J. Geophys. Res., 100*, 10,613–10,631.

Picaut, J., A.J. Busalacchi, M.J. McPhaden, L. Gourdeau, F.I. Gonzalez, and E.C. Hackert, 1995: Open- ocean validation of TOPEX/POSEIDON sea level in the western equatorial Pacific. *J. Geophys. Res., 100*, 25,109–25,127.

Smith, N.R., G.T. Needler, and the Ocean Observing System Development Panel, 1995: An Ocean Observing System for Climate: The Conceptual Design. *Climatic Change, 31*, 475–494.

Zhang, G.J. and M.J. McPhaden, 1995: On the relationship between sea surface temperature and latent heat flux in the equatorial Pacific. *J. Climate, 8*, 589–605.

Zhang, G. J., V. Ramanathan, and M.J. McPhaden, 1995: Convection-Evaporation Feedback in the Equatorial Pacific. *J. Climate, 8*, 3040–3051.

Busalacchi, A.J., M.J. McPhaden, and J. Picaut, 1994: Variability in equatorial Pacific sea surface topography during the verification phase of the TOPEX/Poseidon mission. *J. Geophys. Res., 99*, 24,725– 24,738.

Feely, R.A., R. Wanninkhof, C.E. Cosca, M.J. McPhaden, R.H. Byrne, F.J. Millero, F.P. Chavez, T. Clayton,

D.M. Campbell, and P.P. Murphy, 1994: The effect of tropical instability waves on CO_2 species distributions along the equator in the eastern equatorial Pacific during the 1992 ENSO event. *Geophys. Res. Lett., 21*, 277–280.

Lien, R.-C., M.J. McPhaden, and D. Hebert, 1994: Intercomparison of ADCP Measurements at 0°,140°W. *J. Atmos. Oceanic Technol., 11*, 1334–1349.

McPhaden, M.J., 1994: The eleven-year El Niño? *Nature, 370*, 326–327.

Morrissey, M., W.F. Krawjeski, and M.J. McPhaden, 1994: Estimating rainfall in the tropics using the fractional time raining. *J. Appl. Meteorol., 33*, 387–393.

Reverdin, G., C. Frankignoul, E. Kestenare, and M.J. McPhaden, 1994: Seasonal variability in the surface currents of the equatorial Pacific. *J. Geophys. Res., 99*, 20,323–20,344.

Sprintall, J. and M.J. McPhaden, 1994: Surface layer variations observed in multi-year time series measurements from the western equatorial Pacific. *J. Geophys. Res., 99*, 963–979.

Delcroix, T., G. Eldin, M.J. McPhaden, and A. Morliere, 1993: Effects of westerly wind bursts upon the western equatorial Pacific Ocean, February–April 1991. *J. Geophys. Res., 98*, 16,379–16,386.

Johnson, E.S. and M.J. McPhaden, 1993: Effects of a three-dimensional mean flow on intraseasonal Kelvin waves in the equatorial Pacific Ocean. *J. Geophys. Res., 98*, 10,185–10,194.

Johnson, E.S. and M.J. McPhaden, 1993: On the structure of intraseasonal Kelvin waves in the equatorial Pacific Ocean. *J. Phys. Oceanogr., 23*, 608–625.

Kuroda, Y. and M.J. McPhaden, 1993: Variability in the western equatorial Pacific Ocean during JAPACS cruises in 1989 and 1990. *J. Geophys. Res., 98*, 4747–4759.

McPhaden, M.J., 1993: TOGA-TAO and the 1991–92 ENSO event. *Oceanogr., 6*, 36–44.

McPhaden, M.J., 1993: Tradewind fetch-related variations in equatorial undercurrent depth, speed and transport. *J. Geophys. Res., 98*, 2555–2559.

McPhaden, M.J., F. Bahr, Y. du Penhoat, E. Firing, S.P. Hayes, P.P. Niiler, P.L. Richardson, and J.M. Toole, 1992: The response of the western equatorial Pacific Ocean to westerly wind bursts during November 1989–January 1990. *J. Geophys. Res., 97*, 14,289–14, 03.

McPhaden, M.J. and H. Peters, 1992: On the diurnal cycle of near surface temperature variability in the eastern equatorial Pacific. *J. Phys. Oceanogr., 22*, 1317–1329.

Moum, J.N., M.J. McPhaden, D. Hebert, H. Peters, C.A. Paulson, and D.R. Caldwell, 1992: Internal waves, dynamic instabilities and turbulence in the equatorial thermocline. *J. Phys. Oceanogr., 22*, 1357–1359.

Hayes, S.P., P. Chang, and M.J. McPhaden, 1991: Variability of the sea surface temperature in the eastern equatorial Pacific during 1986–88. *J. Geophys. Res., 96*, 10,553–10,566.

Hebert, D., J.N. Moum, C.A. Paulson, D.R. Caldwell, T.K. Chereskin, and M.J. McPhaden, 1991: Detailed structure of the upper ocean in the central equatorial Pacific during April 1987. *J. Geophys. Res., 96*, 7127–7136.

McPhaden, M.J., D.V. Hansen, and P.L. Richardson, 1991: A comparison of ship drift, drifting buoy and current meter mooring velocities in the Pacific South Equatorial Current. *J. Geophys. Res., 96*, 775–782.

McPhaden, M.J. and S.P. Hayes, 1991: On the variability of winds, sea surface temperature, and surface layer heat content in the western equatorial Pacific. *J. Geophys. Res., 96*(Suppl.), 3331–3342.

Busalacchi, A.J., M.J. McPhaden, J. Picaut, and S. Springer, 1990: Sensitivity of wind-driven tropical Pacific Ocean simulations on seasonal and interannual time-scale. *J. Mar. Sys., 1*, 119–154.

Bender, M. and M.J. McPhaden, 1990: Anomalous nutrient distribution in the equatorial Pacific in April 1988: evidence for rapid biological uptake. *Deep-Sea Res., 37*, 1075–1084.

Landsteiner, M., M.J. McPhaden, and J. Picaut, 1990: On the sensitivity of Sverdrup transport estimates to the specification of wind stress forcing in the tropical Pacific. *J. Geophys. Res., 95*, 1681–1691.

Latif, M., J. Biercamp, H. von Storch, M.J. McPhaden, and E. Kirk, 1990: Simulation of ENSO related surface wind anomalies with an atmospheric GCM forced by observed SST. *J. Climate, 3*, 509–521.

McPhaden, M.J., 1990: Comment on Chiswell and Lukas "Rossby-gravity waves in the central equatorial Pacific during the NORPAX Hawaii-to-Tahiti Shuttle Experiment." *J. Geophys Res., 95*, 805–806.

McPhaden, M.J., H.P. Freitag, and A.J. Shepherd, 1990: Moored salinity times series measurements in the equatorial Pacific Ocean. *J. Atmos. Oceanic Technol., 7*, 568–575.

McPhaden, M.J. and S.P. Hayes, 1990: Variability in the eastern equatorial Pacific during 1986–1988. *J. Geophys Res., 95*, 13,195–13,208.

McPhaden, M.J., S.P. Hayes, L.J. Mangum, and J. Toole, 1990: Variability in the western equatorial Pacific during the 1986-87 El Niño/Southern Oscillation event. *J. Phys. Oceanogr., 20*, 190–208.

McPhaden, M.J. and J. Picaut, 1990: El Niño-Southern Oscillation displacements of the western equatorial Pacific warm pool. *Science, 250*, 1385–1388.

McPhaden, M.J. and P. Ripa (1990): Wave-mean flow interactions in the equatorial ocean. *Ann. Rev. Fluid Mech., 22*, 167–205.

Picaut, J., A.J. Busalacchi, M.J. McPhaden, and B. Camusat, 1990: Validation of the geostrophic method for

estimating zonal currents at the equator from GEOSAT altimeter data. *J. Geophys. Res., 95*, 3015–3024.

Springer, S., M.J. McPhaden, and A.J. Busalacchi, 1990: Oceanic heat content variability in the tropical Pacific during the 1982–83 El Niño. *J. Geophys Res., 95*, 22,089–22,102.

Freitag, H.P., M.J. McPhaden, and A.J. Shepherd, 1989: Comparison of equatorial winds as measured by cup vs. propellor anemometers. *J. Atmos. Oceanic Technol., 6*, 327–332.

Hayes, S.P., M.J. McPhaden, and A. Leetmaa, 1989: Observational verification of a quasi-real-time simulation of the tropical Pacific Ocean. *J. Geophys. Res., 94*, 2147–2157.

Hayes, S.P., M.J. McPhaden, and J.M. Wallace, 1989: The influence of sea surface temperature upon surface wind in the eastern equatorial Pacific: weekly to monthly variability. *J. Climate, 2*, 1500–1506.

Picaut, J., S.P. Hayes, and M.J. McPhaden, 1989: Use of the geostropic approximation to estimate time varying zonal currents at the equator. *J. Geophys. Res., 94*, 3228–3236.

Reynolds, R.W., K. Arpe, C. Gordon, S.P. Hayes, A. Leetmaa, and M.J. McPhaden, 1989: A comparison of tropical Pacific surface winds. *J. Climate, 2*, 105–111.

McPhaden, M.J., A.J. Busalacchi, and J. Picaut, 1988: Observations and wind-forced model simulations of the mean seasonal cycle in tropical Pacific sea surface topography. *J. Geophys. Res., 93*, 8131–8146.

McPhaden, M.J., A.J. Busalacchi, J. Picaut, and G. Raymond, 1988: A model study of potential sampling errors due to data scatter around XBT transects in the tropical Pacific. *J. Geophys. Res., 93*, 8119–8130.

McPhaden, M.J. and R.A. Fine, 1988: A dynamical interpretation of the tritium maximum in the central equatorial Pacific. *J. Phys. Oceanogr., 18*, 1454–1457.

McPhaden, M.J., H.P. Freitag, S.P. Hayes, B.A. Taft, Z. Chen, and K. Wyrtki, 1988: The response of the equatorial Pacific Ocean to a westerly wind burst in May 1986. *J. Geophys. Res., 93*, 10,589–10, 603.

McPhaden, M.J., H.P. Freitag, S.P. Hayes, B.A. Taft, Z. Chen, and K. Wyrtki, 1988: Reply to comment by Harrison and Giese. *J. Geophys. Res., 94*, 5027–5028.

McPhaden, M.J. and B.A. Taft, 1988: On the dynamics of seasonal and intraseasonal variability in the eastern equatorial Pacific. *J. Phys. Oceanogr., 18*, 1713–1732.

Rothstein, L.M., M.J. McPhaden, and J.A. Proehl, 1988: Wind forced wave-mean flow interactions in the equatorial waveguide, I: The Kelvin wave. *J. Phys. Oceanogr., 18*, 1435-1447.

McPhaden, M.J. and A.E. Gill, 1987: Topographic scattering of equatorial Kelvin waves. *J. Phys. Oceanogr., 17*, 82–96.

McPhaden, M.J., J.A. Proehl, and L.M. Rothstein, 1987: Note on the structure of equatorial waves. *J. Phys. Oceanogr., 17*, 1555–1559.

McPhaden, M.J., 1986: The Equatorial Undercurrent: 100 years of discovery. *Eos Trans. AGU, 67*, 762–765.

McPhaden, M.J., J.A. Proehl, and L.M. Rothstein, 1986: The interaction of equatorial Kelvin waves with realistically sheared zonal currents. *J. Phys. Oceanogr., 16*, 1499–1516.

Reverdin, G. and M.J. McPhaden, 1986: Near surface current and temperature variability observed in the equatorial Atlantic from drifting buoys. *J. Geophys. Res., 91*, 6569–6581.

McPhaden, M.J., 1985: Finestructure variability observed in CTD measurements form the central equatorial Pacific. *J. Geophys. Res., 90*, 11,726–11,740.

Bretherton, F.P., M.J. McPhaden, and E.B. Kraus, 1984: Design studies for climatological measurements of heat storage. *J. Phys. Oceanogr., 14*, 318–337.

McPhaden, M.J., 1984: On the dynamics of equatorial subsurface counter currents. *J. Phys. Oceanogr., 14*, 1216–1225.

McPhaden, M.J., M. Fieux, and J. Gonella, 1984: Meanders observed in surface currents and hydrography during an equatorial Atlantic transect. *Geophys. Res. Lett., 11*, 757–760.

McPhaden, M.J., G. Reverdin, J. Merle, Y. du Penhoat, and A. Kartavtseff, 1984: Objective analysis of simulated equatorial Atlantic Ocean data on seasonal time scales. *Deep-Sea Res., 31*, 551–569.

Reverdin, G., J. Gonella, M. Fieux, and M.J. McPhaden, 1984: Temperature variations in the equatorial Atlantic as revealed by drifting buoys. *Geophys. Res. Lett., 11*, 791–794.

McPhaden, M.J., 1982: Variability in the central equatorial Indian Ocean, Part I: Ocean dynamics. *J. Mar. Res., 40*, 157–176.

McPhaden, M.J., 1982: Variability in the central equatorial Indian Ocean, Part II: Oceanic heat and turbulent energy balance. *J. Mar. Res., 40*, 403–419.

McPhaden, M.J. and A.J. Semtner, 1982: The effects of zonal shear flow on equatorial basin modes. *J. Phys. Oceanogr., 12*, 795–804.

McPhaden, M.J., 1981: Continuously stratified models of the steady state equatorial ocean. *J. Phys. Oceanogr., 11*, 337–354.

McPhaden, M.J. and R.A. Knox, 1979: Equatorial Kelvin and inertio-gravity waves in zonal shear flow. *J. Phys. Oceanogr., 9*, 263–277.

OTHER PUBLICATIONS (Meeting Proceedings, Book Chapters, Technical Reports, Newsletters)

Alvera-Azcarate, A., C. Troupin, H. Goosse, M.J. McPhaden, and J.-M. Beckers, 2020: Editorial to the LiegeColloquium Special Issue: Long-term studies in oceanography – a celebration of 50 years of science at the Liege Colloquium (1969-2018). *Ocean Dyn.* https://doi.org/10.1007/s10236-020-01421-0.

Hermes, J., N. D'Adamo, L. Beal, R. Koll, N. Hardman-Mountford, E. Heslop, Y. Masumoto, and M.J. McPhaden, 2020: IndOOs, the Indian Ocean Region Panel and OceanObs'19. *CLIVAR Exchanges*, No. 78 (February 2020), p. 59-63. DOI:10.36071/clivar.78.2020.

Johns, W., S. Speich, M. Araujo and lead authors, 2021: Tropical Atlantic Observing System (TAOS) ReviewReport. CLIVAR-01/2021, 218pp.

McPhaden, M.J., 2020: Reflections on the Origins of the Indian Ocean Observing System (IndOOS). CLIVAR Exchanges, No. 78 (February 2020), p. 64-73. DOI:10.36071/clivar.78.2020.

McPhaden, M.J., A. Santoso, and W. Cai, 2020: Advancing Knowledge of ENSO in a Changing Climate. *Eos, 101*. https://doi.org/10.1029/2020EO151271.

Freitag, H.P., M.J. McPhaden, and K.J. Connell, 2019: Global Tropical Moored Buoy Array: Wind Direction Accuracy Revisited. NOAA Tech. Memo OAR PMEL-150. Pacific Marine Environmental Laboratory, Seattle, WA, 17 pp.

Freitag, H.P., M.J. McPhaden, and K.J. Connell, 2018: Comparison of ATLAS and T-Flex Mooring Data. NOAA Tech Memo. OAR PMEL-149, NOAA/Pacific Marine Environmental Laboratory, Seattle, WA.,

60pp.

Guilyardi, E., A. Wittenberg, M. Balmaseda, W. Cai, M. Collins, M.J. McPhaden, M. Watanabe, S.-W. Yeh, 2016: Fourth CLIVAR Workshop on the Evaluation of ENSO Processes in Climate Models: ENSO in a Changing Climate. *Bull. Am. Meteor. Soc., 97*, 817-820.

Hood, R.R., H.W. Bange, L. Beal, L.E. Beckley, P. Burkill, G.L. Cowie, N. D'Adamo, G. Ganssen, H. Hendon, J. Hermes, M. Honda, M.J. McPhaden, M. Roberts, S. Singh, E. Urban, and W. Yu., 2015: Science Plan of the Second International Indian Ocean Expedition (IIOE-2): A Basin-Wide Research Program. Scientific Committee on Oceanic Research, Newark, Deleware, USA.

Santoso A., W. Cai, M. Collins, M.J. McPhaden, F.-F. Jin, E. Guilyardi, G. Vecchi, D. Dommenget, and G. Wang, 2015: ENSO extremes and diversity: dynamics, teleconnections, and impacts. *Bull. Am. Meteor. Soc., 96*, 1969-1972.

Wang, Y., M.J. McPhaden, P. Freitag, and C. Fey, 2015: Moored acoustic Doppler profiler time series in the central equatorial Indian Ocean. *NOAA Technical Memorandum OAR-PMEL-146*. US Department of Commerce, Washington, DC. 23 pp.

Brandt, P., M. Araujo, Bernard Bourlès, P. Chang, M. Dengler, W.E. Johns, A. Lazar, C.F. Lumpkin, M.J. McPhaden, P. Nobre, and L. Terray, 2013: Tropical Atlantic climate experiment (TACE). CLIVAR Exchanges, 18(1), p. 26-31.

Praveen Kumar, B.J. Vialard, M. Lengaigne, V.S.N. Murty, M.J. McPhaden, M.F. Cronin, and K. Gopala Reddy, 2012: Evaluation of Air-sea heat and momentum fluxes for the tropical oceans and introduction of TropFlux. *CLIVAR Exchanges, 17 (1)*, p. 21-24, National Oceanography Centre, Southhampton, UK.

Yu W., M.J. McPhaden, C. Ning, H. Wang, Y. Liu, H.P. Freitag, 2012: Bailong Buoy: A new Chinese contribution to RAMA. *CLIVAR Exchanges, 17 (1)*, p. 25-28, National Oceanography Centre, Southhampton, UK.

McPhaden, M.J., 2007: El Niño and La Niña: Physical Mechanisms and Climate Impacts. In: The Impact of Environmental Variability on Ecological Systems. D.A. Vasseur and K.S. McCann (Eds.). Springer, New York, p. 1–16.

Smithsonian Institution, 2007: Hidden Depths: Atlas of the Oceans. Harper Collins, New York, 256pp.
Freitag, H.P., M.J. McPhaden, M.F. Cronin, C.L. Sabine, D.C. McClurg, and P.D. McLain, 2006: PMEL

Contributions to the OceanSITES Program. In *Oceans 2006: Revolutionizing Marine Science and Technology*, MTS/IEEE, Boston, MA, 18–21 September 2006, 6 pp.

McPhaden, M.J., 2006: An Indian Ocean moored buoy array for climate. In: *Annual Report on The State of the Ocean and the Ocean Observing System for Climate*, Annual Report, Fiscal Year 2005, J.M. Levy (ed.), NOAA/Climate Program Office/Office of Climate Observation, 130–133.

McPhaden, M.J., 2006: El Niño and Ocean Observations: A personal history. In: *Physical Oceanography*, Developments Since 1950. M. Jochum and R. Murtugudde (Eds.), Springer, New York, p. 79-99.

McPhaden, M.J., 2006: Equatorial Pacific Ocean variability (El Niño). In: *Annual Report on The State of the Ocean and the Ocean Observing System for Climate*, Annual Report, Fiscal Year 2005, J.M. Levy (ed.), NOAA/Climate Program Office/Office of Climate Observation, 85–87.

McPhaden, M.J., 2006: Pilot Research Moored Array in the Tropical Atlantic. In: *Annual Report on The State of the Ocean and the Ocean Observing System for Climate*, Annual Report, Fiscal Year 2005, J.M. Levy (ed.), NOAA/Climate Program Office/Office of Climate Observation, 133–135.

McPhaden, M.J., Y. Kuroda, and V.S.N. Murty, 2006: Development of an Indian Ocean moored buoy array for climate studies. *CLIVAR Exchanges, Vol. 11*, No. 4, International CLIVAR Office, Southampton, UK, p. 3–5.

Molinari, R.L., R. Lumpkin, C. Schmid, and M.J. McPhaden, 2006: NOAA's PIRATA northeast extension. In: *Annual Report on The State of the Ocean and the Ocean Observing System for Climate*, Annual Report, Fiscal Year 2005, J.M. Levy (ed.), NOAA/Climate Program Office/Office of Climate Observation, 136–137.

Freitag, H.P, T.A. Sawatzky, K.B. Ronnholm, and M.J. McPhaden, 2005: Calibration procedures and instrumental accuracy estimates of next generation water temperature and pressure measurements. NOAA Tech. Memo OAR PMEL-128, NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 22 pp.

McPhaden, M.J. (2005): An Indian Ocean moored buoy array for climate. In: *The State of the Ocean and the Ocean Observing System for Climate*, Annual Report, Fiscal Year 2004, NOAA/OGP/Office of Climate Observation, Section 3.22a, 197–200.

McPhaden, M.J. (2005): Evolution of the 2004 El Niño. In: *The State of the Ocean and the Ocean Observing System for Climate*, Annual Report, Fiscal Year 2004, NOAA/OGP/Office of Climate Observation, Section 2.4, 39–41.

McPhaden, M.J. (2005): Pilot Research Moored Array in the Tropical Atlantic (PIRATA). In: *The State of the Ocean and the Ocean Observing System for Climate*, Annual Report, Fiscal Year 2004, NOAA/OGP/Office of Climate Observation, Section 3.23a, 201–203.

McPhaden, M.J., 2004: Book review of "Our Affair with El Niño" by S. George Philander, Princeton University Press, 2004. *Nature, 429*, 605–606.

McPhaden, M.J., A. Hollingsworth, B.P. Kirtman, R.W. Reynolds, F. Vossepoel, and S.E. Wijffels, 2004: Evolution of the observing system for seasonal-to-interannual climate prediction. In: *Conference Program, CLIVAR 2004*, 21–25 June 2004, Baltimore, MD. World Climate Research Program, Geneva, Switzerland, p. 36.

Plimpton, P.E., H.P. Freitag, and M.J. McPhaden, 2004: Processing of subsurface ADCP data in the equatorial Pacific. NOAA Tech. Memo. OAR PMEL-125, Pacific Marine Environmental Laboratory, Seattle, WA. 41pp.

Freitag, H.P., M.J. McPhaden, C. Meinig, and P. Plimpton, 2003: Mooring motion bias of point Doppler current meter measurements. In: *Proceedings of the IEEE Seventh Working Conference on Current Measurement Technology*, San Diego, CA, 13–15 March 2003, IEEE, Piscataway, NJ, 155–160.

Lake, B.J., S.M. Noor, H.P. Freitag, and M.J. McPhaden (2003): Calibration procedures and instrumental accuracy estimates of ATLAS air temperature and relative humidity measurements. NOAA Tech. Memo. OAR PMEL-123, NTIS: PB2003-104619, NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 23 pp.

A'Hearn, P.N., H.P. Freitag, and M.J. McPhaden, 2002: ATLAS module temperature bias due to solar heating. NOAA Tech. Memo OAR PMEL-121, 24 pp.

Ando, K., D. Behringer, M.J. McPhaden, J. Picaut, and J. Sudre, 2002: Vertical salinity estimates and derived parameters in the equatorial Pacific for GODAE. In: *En Route to GODAE*, 13–15 June 2002, Biarritz, France, CNES, Toulouse, France, 275–276.

Delcroix, T., Y. Gouriou, and M.J. McPhaden, 2002: Monitoring and analysing sea surface salinity changes in the tropical Pacfic. In: *En Route to GODAE*, 13–15 June 2002, Biarritz, France, CNES, Toulouse, France, 217–218.

McPhaden, M.J., 2002: El Niño, La Niña, and the Climate Swings of 1997–98. In: *La Niña and its Impacts*, M. Glantz (Editor). United Nations University Press, Tokyo, Japan, 25–30. McPhaden, M.J., 2002: Ocean Sciences After September 11. *Eos Trans. AGU, 83*, 209.

McPhaden, M.J., 2002: TAO/TRITON tracks Pacific Ocean warming in early 2002. CLIVAR Exchanges, 7(2), International CLIVAR Project Office, Southampton Oceanography Centre, Southampton, UK, p. 7–9.

McPhaden, M.J., 2002: El Niño and La Niña: Causes and Global Consequences. In: Encyclopedia of Global Environmental Change, Vol 1, John Wiley and Sons, Ltd., Chicester, UK, 353–370.

Payne, R.E., K. Huang, R.A. Weller, H.P. Freitag, M.F. Cronin, M.J. McPhaden, C. Meinig, Y. Kuroda, N. Ushijima, R.M. Reynolds, 2002: A comparison of buoy meteorological systems. WHOI Technical Report WHOI-2002-10. Woods Hole Oceanographic Institution, December 2002, 67 pp.

Busalacchi, A.J., J. Picaut, R. Murtugudde, M.J. McPhaden, T. Delcroix, L. Gourdeau, Y. Du Penhoat, and J. Verron, 2001: Application of altimetry measurements to observations and modeling studies of low-frequency upper ocean mass and heat circulation in the tropical Pacific. In: *AVISO Altimetry Newsletter, No. 8*, October 2001. CNES, Toulouse, France, p. 24.

Freitag, H.P., M. O'Haleck, G.C. Thomas, and M.J. McPhaden, 2001: Calibration procedures and instrumental accuracies for ATLAS wind measurements. NOAA. Tech. Memo. OAR PMEL-119, 20 pp.

Kuroda, Y., K. Sono, K. Ando, H.P. Freitag, and M.J. McPhaden, 2001: In-situ buoy data intercomparison between TRITON and TAO in the western tropical Pacific Ocean. Report of Japan Marine Science and Technology Center (JAMSTEC), 43, 93–105.

McPhaden, M.J., 2001: Moored buoy observations for seasonal-to-interannual climate prediction. In: *Proceedings of the Symposium on Climate Variability, the Oceans, and Societal Impacts,* 14–18 January 2001, Albuquerque, NM. Am. Meteorol. Soc., Boston, MA, p.94.

Nystuen, J.A. and M.J. McPhaden, 2001: The beginnings of operational marine weather observations using underwater ambient sound. In: *Proceedings of the Institute of Acoustics.* 9–12 April 2001, University of Southampton, Southampton, England, *23*, 135–141.

Picaut, J., A.J. Busalacchi, T. Delcroix, L. Gourdeau, M.J. McPhaden, R. Murtugudde, Y. Du Penhoat, and J. Verron, 2001: Testing a theory of El Niño with altimetry data: Recharge/discharge of the upper layer of the tropical Pacific Ocean. In: *AVISO Altimetry Newsletter, No. 8*, October 2001. CNES, Toulouse, France, p. 99–100.

Davis, R.E., W.S. Kessler, R. Lukas, R.A. Weller, D.W. Behringer, D.R. Cayan, D.B. Chelton, C. Eriksen, S. Esbensen, R.A. Fine, I. Fukumori, M.C. Gregg, E. Harrison, G.C. Johnson, T. Lee, N.J. Mantua, J.P. McCreary, M.J. McPhaden, J.C. McWilliams, A.J. Miller, H. Mitsudera, P.P. Niiler, B. Qiu, D. Raymond, D. Roemmich, D.L. Rudnick, N. Schneider, P.S. Schopf, D. Stammer, L. Thompson, and W.B. White, 2000: Implementing the Pacific Basin Extended Climate Study (PBECS). U.S. CLIVAR Office Report, Version 2000.2, 123 pp.

Delcroix, T., C. Henin, M. Ioualalen, M. McPhaden, J. Picaut, K. Ando, and L. Gourdeau, 2000: Monitoring and understanding sea surface salinity changes in the tropical Pacific during the 1992–99 ENSO period. In: *Proceedings of the International Conference on the Ocean Observing System for Climate*, 18–22 October 1999, Saint-Raphael, France, Poster Session A, 4 pp.

Feely, R.A., F.P. Chavez, G. Friedrich, M.J. McPhaden, and R. Wanninkhof, 2000: The effect of El Niño events on variability of CO_2 fluxes in the equatorial Pacific. *US JGOFS Newsletter, 10*(3), 1–4.

Freitag, H.P. and M.J. McPhaden, 2000: TAO and PIRATA buoy networks in the tropical Pacific and

Atlantic. In: *Proceedings of the 16th International Conference on IIPS for Meteorology, Oceanography, and Hydrology*, 9–14 January 2000, Long Beach, CA, 225–226.

Freitag, H.P., N.N. Soreide, D.W. Denbo, and M.J. McPhaden, 2000: Data and information management for the TAO and PIRATA moored buoy arrays. In: P*roceedings of the International Conference on The Ocean Observing System for Climate*, 18–22 October 1999, Saint-Raphael, France, Poster Session B, 2 pp.

McPhaden, M.J., 2000: El Niño. McGraw-Hill 2000 Yearbook of Science and Technology Encyclopedia, McGraw-Hill, New York, 131–135.

McPhaden, M.J., 2000: Monitoring the North Pacific for improved ocean, weather, and climate forecasts. In: *Proceedings of the International Symposium TRIANGLE '98*, Kyoto, Japan, 29 September–2 October 1998, 8–9.

McPhaden, M.J., 2000: Getting the Science Right. In Sources, No. 127, October 2000. UNESCO, Paris, France, p. 5.

McPhaden, M.J., T. Delcroix, K. Hanawa, Y. Kuroda, G. Meyers, J. Picaut, and M. Swanson, 2000: The ENSO observing system. In: *Proceedings of the International Conference on the Ocean Observing System for Climate*, 18–22 October 1999, Saint-Raphael, France, Session 2A, 14 pp.

McPhaden, M.J., H.P. Freitag, J. Servain, and E. Josse, 2000: Effects of fishing activity on tropical moored buoy arrays. In: *Peche Thoniere et Dispostifs de Concentration de Possions*, J.-Y. Gall, P. Cayre, and M. Taquet (eds.), IFREMER, Plouzane, France, p. 683.

Plimpton, P.E., H.P. Freitag, and M.J. McPhaden, 2000: Correcting moored ADCP data for fish-bias errors at 0°, 110° W and 0°, 140° W from 1993–1995. NOAA Tech. Memo. OAR PMEL-117 (NTIS PB2000-106363), 35 pp.

Fairall, C.W., P. Hacker, E.F. Bradley, S. Anderson, Y. du Penhoat, C. Eriksen, K.S. Gage, S. Kennan, M. LeMone, M. McPhaden, C. Ohlmann, D. Parsons, C. Paulson, R. Pinkel, S. Rutledge, A. Soloviev, R. Weller, E. Westwater, and E. Zipser, 1999: The legacy of COARE for technology and ocean-atmosphere observing capability. COARE98. In: *Proceedings of a Conference on the TOGA Coupled Ocean-Atmosphere Response Experiment*, Boulder, CO, 7–14 July 1998, WCRP-107, WMO/TD-No. 940, 116–138.

Freitag, H.P., M.E. McCarty, C. Nosse, R. Lukas, M.J. McPhaden, and M.F. Cronin, 1999: COARE Seacat data: Calibrations and quality control procedures. NOAA Tech. Memo. ERL PMEL-115, 89 pp.

McPhaden, M.J., 1999: The ENSO Observing System. In: *Proceedings of the Second Hayes Symposium on Seasonal to Interannual Variability - the 1997/1998 ENSO Cycle*. Am Met. Soc., Annual Meeting, 10–15 January 1999, Dallas, TX, 1.

McPhaden, M. J., 1999: TAO Implementation Panel-Report of the 7th Session. CLIVAR Exchanges, Vol. 4, No. 1, March 1999, International CLIVAR Project Office, Southampton, UK, 10–11.

McPhaden, M.J., 1999: The 1997–98 El Niño. In The Twenty-Third Annual Climate Diagnostics and Prediction Workshop, Miami, FL, 26–30 October, NCEP, NOAA, Washington, DC, 4–7.

McPhaden, M.J. and X. Yu, 1999: Genesis and evolution of the 1997–98 El Niño. In: *Proceedings of the International Symposium TRIANGLE '98,* Kyoto, Japan, 29 September–2 October 1998, JAMSTEC, Yokosuka, Japan, 3–8.

McPhaden, M.J. and X. Yu, 1999: Genesis and evolution of the 1997-98 El Niño. In: *Proceedings of the Second Hayes Symposium on Seasonal to Interannual Climate Variability - The 1997/1998 ENSO Cycle*,

AMS, Dallas, TX, 10–15 January 1999, 38–42.

Cronin, M.F. and M.J. McPhaden, 1998: Comparison of the upper ocean heat and freshwater balances in the western Pacific warm-fresh pool. In: *Proceedings of the Ninth Conference of the Interaction of the Sea and Atmosphere*. January 11–16, 1998, Phoenix, AZ. Am. Met. Soc., Boston, MA, 157–158.

Dickinson, S., S. Singh, K.A. Kelly, M. Spillane, and M.J. McPhaden, 1998: Establishing a mapping methodology for NSCAT winds. Technical Report, APL-UW TR 9801, 23 pp.

Intergovernmental Oceanographic Commission, 1998: *Proceedings of the Sixth Workshop of the TAO Implementation Panel*, Reading, England, 4–6 November 1997. Intergov. Oceanogr. Comm., Paris, France, GOOS Report No. 36, 35 pp.

McPhaden, M.J., 1998: The 1997–98 El Niño. In: *Proceedings of the Twenty-Third Annual Climate Diagnostics and Prediction Workshop*, Miami, FL, 26–30 October 1998, NCEP, NOAA, Washington, DC, 4–7.

Soreide, N.N., D.C. McClurg, W.H. Zhu, D.W. Denbo, and M.J. McPhaden, 1998: Web access to realtime data from the TAO buoy network in the Tropical Pacific Ocean. In: *Proceedings of the Ocean Community Conference '98*, Marine Technology Society, 16–19 November 1998, Baltimore, MD, published on CD-ROM by the Marine Technology Society.

Howe, B. and M.J. McPhaden, 1997: The tropical Pacific and ENSO: The TAO Array and tomography. In: *Proceedings of International Workshop on Ocean Acoustic Tomography*, JAMSTEC, Yokosuka, Japan, 13–14 March 1997, 76–83.

Mangum, L.J., T.B. Wright, and M.J. McPhaden, (Editors), 1997: *Proceedings of the Fifth Workshop of the TAO Implementation Panel*. Goa, India, November 18-21, 1996. GCOS Report No. 31, ICPO Publication Series No. 5, and GOOS Report No. 97/1. Published on behalf of the directorates of the Global Climate Observing System, the Global Ocean Observing System, and the Climate Variability and Predictability Program by NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 52 pp.

McCarty, M.E., L.J. Mangum, and M.J. McPhaden, 1997: Temperature errors in TAO data induced by mooring motion. NOAA Tech. Memo. ERL PMEL-108, (NTIS PB97-146492), Pacific Marine Environmental Laboratory, Seattle, WA, 68 pp.

McClurg, D.C., W.H. Zhu, S. Zube, N.N. Soreide, and M.J. McPhaden, 1997: World Wide Web access to data from the TAO buoy network expanded to include sensor time series. In: Proceedings of the 13th International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography and Hydrology, AMS, 2–7 February 1997, Long Beach, CA, 178–181.

Plimpton, P.E., H.P. Freitag, M.J. McPhaden, and R.H. Weisberg, 1997: Using echo intensity to correct moored ADCP data for fish-bias errors at 0°, 170°W. NOAA Tech. Memo. ERL PMEL-111 (NTIS PB97-20137), 163 pp.

Freitag, H.P., L.J. Mangum, and M.J. McPhaden, 1996: The Tropical Atmosphere Ocean Array provides real-time monitoring of the tropical ocean. Argos Newsletter, 50, 5–7.

Koehn, M.P., L.J. Mangum, and M.J. McPhaden, (Editors), 1996: *Proceedings of the Fourth Workshop of the TAO Implementation Panel*. Fortaleza, Brazil, September 12–14, 1995. WCRP Informal Report 1/1996. Published on behalf of the directorates of the Global Climate Observing System, the Global Ocean Observing System, and the Climate Variability and Predictability Program by NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 61 pp.

McPhaden, M.J., 1996: Moored time series measurements in support of climate studies. In: *Proceedings of the International Workshop on Ocean Climate variations from Seasons to Decades with Special Emphasis on*

Pacific Ocean Buoy Network. Mutsu, Japan, May 29–31, 1996. JAMSTEC, Yokosuka, Japan, 18–21.

Smull, B.F. and M.J. McPhaden, 1996: Comparison of NCEP/NCAR reanalyzed fields and surface observations over the TOGA-TAO Array. In: *Proceedings of the 21st Annual NOAA Climate Diagnostics Workshop*, Huntsville, Alabama, 28 October–1 November 1996, 57–60.

Soreide, N.N. and M.J. McPhaden, 1996: Real-time distribution of data from the TAO moored buoy array in the tropical Pacific. In: *Proceedings of the ECO-INFORMA 96*, Global Networks for Environmental Information, Lake Buena Vista, FL, November 4–7, 1996, 359–365.

Soreide, N.N., D.C. McClurg, W.H. Zhu, M.J. McPhaden, D.W. Denbo, and M.W. Renton, 1996: World Wide Web access to real-time and historical data from the TAO array of moored buoys in the tropical Pacific Ocean: Updates for 1996. In: *Proceedings of the OCEANS 96 MTS/IEEE*, Ft. Lauderdale, FL, September 23–26, 1996, 1354–1359.

Freitag, H.P., Y. Feng, L.J. Mangum, M.J. McPhaden, J. Neander, and L.D. Stratton, 1995: Calibration procedures and instrumental accuracy estimates of TAO temperature, relative humidity, and radiation measurements. NOAA Tech. Memo., ERL PMEL-104, U.S. Dept. of Commerce, Washington, D.C., 32 pp.

Freitag, H.P., L.J. Mangum, and M.J. McPhaden, 1995: Tropical Atmosphere Ocean Array - Update. *Sea Technol., 36*(10), 47–50.

Gourdeau, L., J. Picaut, M.-J. Langlade, A. Busalacchi, M.J. McPhaden, P. Freitag, F. González, M. Eble, and R. Weller, 1995: Data preparation for the open-ocean validation of TOPEX/POSEIDON sea level in the western equatorial Pacific. Notes Techniques, Sciences de la Mer, Océanographie Physique, ORSTOM, No. 12, 43 pp.

Kessler, W.S. and M.J. McPhaden, 1995: Oceanic equatorial waves and the 1991–93 El Niño. In: *Proceedings of the TOGA95 Symposium*, 2–7 April 1995, Melbourne, Australia, WCRP-91, WMO/TD No. 717, December 1995, 333–337.

Kessler, W.S., M.C. Spillane, D.E. Harrison, and M.J. McPhaden, 1995: Scales of variability in the equatorial Pacific inferred from the TOGA-TAO buoy array. In: *Proceedings of the TOGA95 Symposium*, 2–7 April 1995, Melbourne, Australia, WCRP-91, WMO/TD No. 717, December 1995, 210–214.

Koehn, M.P., L.J. Mangum, and M.J. McPhaden, (Editors), 1995: In: *Proceedings of the Third Workshop of the TOGA-TAO Implementation Panel*. Seoul, South Korea, October 18–20, 1994. ITPO Publication, No. 12. Published on behalf of the International TOGA Project Office by NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 61 pp.

Mangum, L.J., H.P. Freitag, and M.J. McPhaden, 1995: TOGA TAO array sampling schemes and sensor evaluations. In: *Proceedings, Oceans '94 OSATES*, 13–16 September 1994, Parc de Penfeld, Brest, France, II-402–II-406.

McPhaden, M.J., 1995: Moored buoys used for El Niño prediction. *Fisheries Newsletter, 74*, 38–40.
McPhaden, M.J., 1995: Report of TOGA-TAO Implementation Panel Meeting. Seoul, Korea, October 18–20, 1994. TOGA Notes, No 18, p. 19.

McPhaden, M.J., 1995: Ocean-atmosphere variability observed from the TOGA-TAO Array. In: *Proceedings of the TOGA95 Symposium*, 2–7 April 1995, Melbourne, Australia, 181–185.

McPhaden, M.J., 1995: The Tropical Atmosphere-Ocean Array is completed. *Bull. Am. Meteorol. Soc., 76*, 739–741.

McPhaden, M.J., W.S. Kessler, N.N. Soreide, and D.C. McClurg, 1995: What is an El Niño? *Mariner Weather*

Log, 39(2), 34–37.

McPhaden, M.J., L. Merlivat, G. Needler, W.D., Jr. Nowlin, R.W. Schmitt, N. Smith, P.K. Taylor, A.F. Vézina, M. Wakatsuchi, R. Weller, and A. Alexiou, 1995: Scientific design for the common module of the Global Ocean Observing System and the Global Climate Observing System: An ocean observing system for climate. Final Report of the Ocean Observing System Development Panel, Department of Oceanography, Texas A&M University, College Station, TX, 265 pp.

McPhaden, M.J., W. Wang, and C. Zhang, 1995: On the relationship between sea surface temperature, pressure, and zonal winds in the equatorial Pacific. In: *Proceedings of the 20th Annual Climate Diagnostics Workshop*, University of Washington, Seattle, Washington, 23–27 October 1995. Climate Prediction Center, Washington, D.C., 97–100.

Picaut, J. J.-P. Boulanger, A.J. Busalacchi, T. Delcroix, L. Gourdeau, M.J. McPhaden, C. Menkes, and Y. Du Penhoat, 1995: ENSO and altimetry. In: *Proceedings of the TOGA95 Symposium*, 2–7 April 1995, Melbourne, Australia, 74–78.

Picaut, J., A.J. Busalacchi, M.J. McPhaden, E.J. Katz, L. Gourdeau, F.I. Gonzalez, E.C. Hackert, and M. Bushnell, 1995: Open-ocean validation of TOPEX/POSEIDON sea level in the western equatorial Pacifique. L'Institut Français de Recherche Scientifique pour le Developpement en Cooperation, Centre de Nouméa. Conventions Sciences de la mer, Océanographie Physique No. 5, 76 pp.

Plimpton, P.E., H.P. Freitag, and M.J. McPhaden, 1995: Correcting moored ADCP data for fish-bias errors at 0°,110°W and 0°,140°W from 1990–1993. NOAA Tech. Memo. ERL PMEL-107, 49 pp.

Soreide, N.N., D.C. McClurg, W.H. Zhu, D.W. Denbo, and M.J. McPhaden, 1995: TAO display software for TOGA-TAO buoy data. In: *Proceedings of the 11th International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology*, Dallas, TX, January 15–20, 1995, 322–326.

Soreide, N.N., D.C. McClurg, W.H. Zhu, M.J. McPhaden, L.J. Mangum, and D.W. Denbo, 1995: Distribution and display of TOGA-TAO buoy data. In: *Proceedings, Oceans '94 OSATES*, 13–16 September 1994, Parc de Penfeld, Brest, France, I-444–I-448.

Soreide, N.N., W.H. Zhu, D.C. McClurg, M.J. McPhaden, and M.W. Renton, 1995: Access to realtime data from the TAO array of moored buoys via UNIX/X-WINDOWS or the World Wide Web and Mosaic. In: *Proceedings of OCEANS '95*, San Diego, CA, October 9–12, 1995, Vol. 1, 360–365.

Thiele, O.W., M.J. McPhaden, and D.A. Short, 1995: *Optical Rain Gauge Performance: Proceedings of the Second Workshop on Optical Rain Gauge Measurements*, held at NASA Goddard Space Flight Center, Greenbelt, Maryland April 21–22, 1994. NASA Conference Publication 3288, 76 pp.

Freitag, H.P., Y. Feng, L.J. Mangum, M.J. McPhaden, J. Neander, and L.D. Stratton, 1994: Calibration procedures and instrumental accuracy estimates of TAO temperature, relative humidity and radiation measurements. NOAA Tech. Memo. ERL PMEL-104 (PB95-174827), 32 pp.

Brainard, R.E., 1994: The diurnal cycle of high-frequency temperature variability at 0°,140°W on seasonal and interannual time scales. Naval Postgraduate School, Monterey, CA, June 1994. Ph.D. Dissertation, 156 pp.

McPhaden, M.J. (Editor), 1994: *Proceedings of the Second Workshop of the TOGA-TAO Implementation Panel*. Bali, Indonesia, October 18–20, 1993. ITPO Publication, No. 10. Published on behalf of the International TOGA Project Office by NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 53 pp.

Soreide, N.N., D.C. McClurg, W.H. Zhu, D.W. Denbo, and M.J. McPhaden, 1994: TAO software for real-

time and historical TOGA-TAO data display and analysis. In: *Proceedings of the Tenth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology*, Nashville, TN, January 23–28, 1994, 285–290.

Thiele, O.W., D.A. Short, J.C. Gerlach, D.B. Wolff, M.J. McPhaden, and J.C. Wilkerson, 1994: TOGA-COARE ocean precipitation morphology. In: *Proceedings of the Sixth Conference on Climate Variations; 74th AMS Annual Meeting*, Nashville, TN, January 23–28, 1994, 96–100.

Freitag, H.P., P.E. Plimpton, and M.J. McPhaden, 1993: Evaluation of an ADCP Fish-Bias Rejection Algorithm. In: *Proceedings of the Oceans '93*, October 18–21, 1993, Victoria B.C. Canada, II-394–397.

Kessler, W.S., D.E. Harrison, and M.J. McPhaden, 1993: Design and assessment of the Tropical Pacific Thermal Monitoring System using the GFDL OGCM. In: *Proceedings of the Workshop on the Use of Sub-Surface Thermal Data for Climate Studies*, Brest, France, 13–16 September 1993. ITPO Report No. 9, WOCE Report No. 110/93, 47–49.

McCarty, M.E. and M.J. McPhaden, 1993: Mean seasonal cycles and interannual variations at 0°,165° during 1986–1992. NOAA Tech. Memo. ERL PMEL-98 (PB93-186195), 64 pp.

McPhaden, M.J, 1993: Stanley P. Hayes (1944–1992), in memoriam. *Bull. Am. Meteorol. Soc., 74*, 1396–1398.

McPhaden, M.J., 1993: TOGA-COARE Optical Rain Gauge Measurements. Workshop Report, Seattle, Washington, 31 March–1 April 1993, TOGA Notes, No. 13, 18–19.

McPhaden, M.J. (Editor), 1993: Proceedings of the First Workshop of the TOGA-TAO Implementation Panel. Joint Institute for Marine and Atmospheric Research, East-West Center, University of Hawaii, Honolulu, HI, November 9–10, 1992, JIMAR Tech. Rep., 26 pp.

McPhaden, M.J., H.B. Milburn, P.A. Arkin, O.W. Thiele, J. Wilkerson, and W.F. Krajewski, 1993: Moored optical rain gage measurements from the equatorial Pacific Ocean. In: *Proceedings of the Fourth International Conference on Precipitation*, Iowa City, Iowa, April 26–28, 1993, Iowa Institute for Hydraulic Research, Iowa City, 32–33.

The Ocean Observing System Development Panel, 1993: Interim design for the ocean component of a global climate observing system. Department of Oceanography, Texas A&M, College Station, Texas, 105 pp.

Soreide, N.N. and M.J. McPhaden, 1993: The TAO workstation software: Display real-time data from the TOGA-TAO array. *Earth System Monitor*, No. 3, 4ff.

Soreide, N.N., D.C. McClurg, W.H. Zhu, D.W. Denbo, and M.J. McPhaden, 1993: The TAO workstation display software for real-time data from the TOGA-TAO array of moored buoys. Oceans '93, Engineering in Harmony with the Ocean, Proceedings, Vol. III, 18–21 October 1993, Victoria, Canada, 340–343.

Soreide, N.N. and M.J. McPhaden, 1993: The TAO workstation display software for real-time data from the TOGA TAO array. In: *Proceedings, Fourth International Conference on Southern Hemisphere Meterology and Oceanography*, 29 March–2 April 1993, Hobart, Australia, 422–423.

Sprintall, J. and M.J. McPhaden (1993): Hydrodynamic regimes in the western equatorial Pacific warm pool. In: *Proceedings of the Fourth International Conference on Southern Hemisphere Meteorology and Oceanography*, Hobart, Australia, March 29–April 2, 1993, 390–391.

Freitag, H.P., M.J. McPhaden, and P.E. Pullen, 1992: Fish-induced bias in acoustic Doppler current profiler data. In: *Proceedings of the Oceans '92 Conference*, Newport, R.I., 26–29 October 1992, p. 712–717.

Hayes, S.P. and M.J. McPhaden, 1992: ENSO Update: winds, temperature and currents in the equatorial

Pacific. U.S. JGOFS News, No. 3, p. 4.

Hayes, S.P. and M.J. McPhaden, 1992: Temporal sampling requirements for low frequency temperature variability in the eastern equatorial Pacific Ocean. NOAA Tech. Memo. ERL PMEL-96, 17 pp.

Kuroda, Y., K. Ando, K. Muneyama, and M.J. McPhaden, 1992: Current structures in the western equatorial Pacific during JAPACS cruises. In: *Proceedings of the PORSEC '92 Conference*, 25–31 August 1992, Okinawa, Japan, Vol 1, 100–105.

McPhaden, M.J., 1992: Stan Hayes, in memoriam. TOGA-NOTES, No. 9, p. 21–22.

McPhaden, M.J. and M.E. McCarty, 1992: Mean seasonal cycles and interannual variations at 0°,110°W and 0°,140°W during 1980–1991. NOAA Tech. Memo. ERL PMEL-95 (PB93-114726), 118 pp.

McPhaden, M.J. and H.B. Milburn, 1992: Moored precipitation measurements for TOGA. TOGA Notes, No.

7, p. 1-5.

Picaut, J., A.J. Busalacchi, T. Delcroix, and M.J. McPhaden, 1992: Rigorous open-ocean validation of TOPEX/POSEIDON sea level in the western equatorial Pacific. TOPEX/POSEIDON Joint Verification Plan, NASA, Jet Propulsion Laboratory. *JPL*, 92-2, V14–V16.

Pullen, P.E., McPhaden, M.J., H.P. Freitag, and J. Gast, 1992: Skew errors in acoustic Doppler current profiler data from near-surface high vertical shear flow regimes. In: *Proceedings of the Oceans '92 Conference*, Newport, R.I., 26–29 October 1992, 706–711.

Steffin, O. and M.J. McPhaden, 1992: The TOGA-TAO Array. Argos Newsletter, Special Issue on Operational Program, pp. 8–11.

Freitag, H.P., M.J. McPhaden, C.S. Coho, and A.J. Shepherd, 1991: Equatorial wind, current, and temperature data: 108°W to 140°W; April 1983–October 1987. NOAA Data Report ERL PMEL-35 (PB92-119817), 116 pp.

McPhaden, M.J., H.B. Milburn, A.I. Nakamura, and A.J. Shepherd, 1991: PROTEUS - Profile Telemetry of Upper Ocean Currents. *Sea Technol. Mag., 32*, February 1991, 10–19.

McPhaden, M.J., A.J. Shepherd, W.G. Large, and P.P. Niiler, 1991: A TOGA array of drifting thermistor chains in the western equatorial Pacific Ocean: October 1989–January 1990. NOAA Data Report ERL PMEL-34 (PB91-224535), 171 pp.

Picaut, J., T. Delcroix, Y. du Penhoat, A.J. Busalacchi, Jr., G. Gautier, S.P. Hayes, and M.J. McPhaden, 1991: Application of TOPEX/POSEIDON altimetry measurements to observational and modeling studies of the low-frequency upper ocean mass and heat circulation in the tropical Pacific. TOPEX/POSEIDON Science Investigations Plan, NASA, Jet Propulsion Laboratory, *JPL*, 91-27, 114– 117.

Yue, F., H.P. Freitag, M.J. McPhaden, and A.J. Shepherd, 1991: Wind, current, and temperature data at 0°,165°E; January 1986–March 1991. NOAA Data Report ERL PMEL-36, 54 pp.

Hayes, S.P., L.J. Mangum, M.J. McPhaden, and J. Picaut, 1990: Thermal structure variability along 165°E. In: *Proceedings of the Symposium on US/PRC Bilateral Air-Sea Interaction Program*, Beijing, PRC, 101–111.

McPhaden, M.J., 1990: Moored time series measurements. *Eos Trans. AGU, 71*, p. 760. McPhaden, M.J., 1990: A TOGA moored observing array for equatorial currents, 1990–1994. In:

Proceedings of the 9th Session of the JSC/CCCO TOGA Scientific Steering Group, Kona, HI, July 23– 25, 1990, World Climate Research Programme Publication, WCRP-47, 23 pp.

McPhaden, M.J. and S.P. Hayes, 1990: Moored velocity, temperature and wind measurements in the equatorial Pacific Ocean: A review of scientific results, 1985–1990. In: *Proceedings of the International TOGA Scientific Conference*, Honolulu, HI, July 16–20, 1990. Report WCRP-43, World Meteorological Organization, Geneva, Switzerland, 59–69.

McPhaden, M.J., S.P. Hayes, L.J. Mangum, and J. Toole (1990): Variability in the western equatorial Pacific Ocean during the 1986–87 El Niño/Southern Oscillation event. Air-Sea Interaction in Tropical Western Pacific. In: *Proceedings of the US-PRC International TOGA Symposium.* 1988, Beijing, PRC, 41–58.

McPhaden, M.J., H.B. Milburn, A.I. Nakamura, and A.J. Shepherd, 1990: PROTEUS--Profile Telemetry of Upper Ocean Currents. In: *Proceedings of the Marine Tech. Soc. Conference*, 25–28 September 1990, The Marine Technology Society, Washington, D.C., 353–357.

Shuzhen, P., Y. Huiling, J. Toole, B. Millard, M.J. McPhaden, and L.J. Mangum, 1990: Comparison among autoregression models for forecasting El Niño events. Air-Sea Interaction in Tropical Western Pacific, In: *Proceedings of the US-PRC International TOGA Symposium*, 1988, Beijing, China Ocean Press, 59– 66.

Taft, B.A. and M.J. McPhaden, 1990: Diurnal cycle of sea-surface temperature in the western tropical Pacific. In: *Proceedings of the Symposium on US-PRC Bilateral Air-Sea Interaction Program*, Beijing, PRC, 343–352.

Busalacchi, A.J., M.J. McPhaden, J. Picaut, and S. Springer, 1989: Uncertainties in tropical Pacific Ocean simulations: the seasonal and interannual sea level response to three analyses of the surface wind field. In: *Proceedings of the TOGA-COARE Workshop*, May 24–30, 1989, Noumea, New Caledonia, 367–377.

Freitag, H.P., L.J. Mangum, M.J. McPhaden, and S.P. Hayes, 1989: Tropical ocean climate studies. *Argos Newsletter, 37*, 3–7.

Freitag, H.P., M.J. McPhaden, and A.J. Shepherd, 1989: Real-time surface currents from moored buoys. In: *Proceedings of the North American Argos User's Conference*, May 15–17, 1989, San Diego, Service Argos Inc., Landover, MD, 85–100.

Hayes, S.P., M.J McPhaden, J.M. Wallace, and J. Picaut, 1989: The influence of sea-surface temperature on the surface wind in the equatorial Pacific Ocean. In: *Proceedings of the TOGA-COARE Workshop*, May 24–30, 1989, Noumea, New Caledonia, 543–547.

Latif, M., J. Biercamp, H. von Storch, M.J. McPhaden, and E. Kirk, 1989: Analyses of tropical anomalies simulated by an AGCM. Max-Planck-Institut für Meteorologie, Hamburg, Germany, No. 27.

McPhaden, M.J., 1989: On the relationship between winds and upper ocean temperature variability in the western equatorial Pacific. In: *Proceedings of the TOGA-COARE Workshop*, May 24–30, 1989, Noumea, New Caledonia, 283–290.

McPhaden, M.J., 1989: Moored equatorial current measurements in the Pacific Ocean. In: *Proceedings of the International Symposium on Japanese Pacific Climate Studies (JAPACS)*, October 19–20, 1989, Tsukuba Center for Institutes, Tsukuba Science City, Japan, 57:1–57:5.

Picaut, J., B. Camusat, T. Delcroix, M.J. McPhaden, and A.J. Busalacchi, 1989: Surface equatorial flow anomalies in the Pacific Ocean during the 1986–87 ENSO using GEOSAT altimeter data. In: *Proceedings of the TOGA-COARE Workshop*, May 24–30, 1989, Noumea, New Caledonia, 301–309.

Freitag, H.P. and M.J. McPhaden, 1988: EPOCS moored temperature, current and wind measurements at 0°,140°W: May–June, 1987. NOAA Data Report ERL PMEL-23 (B88-19415), 31 pp.

McPhaden, M.J., 1988: PMEL current meter mooring program in the tropical Pacific. In U.S. Global Ocean Flux Study Pacific Planning Report, U.S. GOFS Planning Report No. 9, Woods Hole Oceanographic

Institution, Woods Hole, MA, 91–94.

Hayes, S.P., L.J. Mangum, M.J. McPhaden, and J. Picaut, 1988: Thermal structure variability along 165°E. In: *Proceedings of the Symposium on Western Tropical Pacific Air-Sea Interactions*, Beijing, PRC, November 1988.

Picaut, J., S.P. Hayes, M.J. McPhaden, G. Eldin, J. Grelet, and Y. Montel, 1988: Amelioration des systemes d'observations pour la surveillance en temps reel de la structure thermique du Pacifique Tropical. Compte rendu d'une recherche financee par le MRES, ORSTOM-Noumea, 83 pp.

Von Storch, H., M. Latif, J. Biercamp, M.J. McPhaden, and E. Kirk, 1988: Simulation of the Southern Oscillation. Meteorologisches Institut der Universitat Hamburg, Technical Report #2, G. Fischer (editor), 169–189.

Freitag, H.P., M.J. McPhaden, and A.J. Shepherd, 1987: Equatorial current and temperature data: 108°W to 110°W; October, 1979–November 1983. NOAA Data Report, ERL PMEL-17 (PB87-204004), 99 pp.

Picaut, J., M.J. McPhaden, A.J. Busalacchi, S.P. Hayes, G. Raymond, R. Tournier, and J. Marchand, 1987: Validation d'un modele du Pacifique tropical a l'aide de donnees XBT mouillages chaines a thermistance. Rapport Scientifique PNEDC ASP 19.84.132, ORSTOM-Noumea, 117 pp.

McPhaden, M.J., 1986: The Equatorial Undercurrent: 100 years of discovery. *Eos Trans. AGU, 67*(40), 762–765.

Proehl, J.A., M.J. McPhaden, and L.M. Rothstein, 1986: A numerical approach to equatorial oceanic wave-mean flow interactions. *Advanced Physical Oceanographic Numerical Modelling,* J. O'Brien, editor, Reidel Press, 111–126.

Kessler, W.S., B.A. Taft, and M.J. McPhaden, 1985: An assessment of the XBT sampling network in the central Pacific. UCAR Tech. Rept., USTOGA4, 62 pp.

McPhaden, M.J. and G. Meyers, 1985: Proceedings of a TOGA Workshop on Ocean Thermal Data Management. UCAR Tech. Rept., USTOGA6.

McPhaden, M.J., B.A. Taft (ed.), 1984: In: *Proceedings of the First International TOGA Workshop on Thermal Sampling*. UCAR Tech. Rept., USTOGA 3, 53 pp.

McPhaden, M.J., 1983: Equatorial sea surface temperature variations on seasonal time scales. In: *Marine Hydrodynamics of the Equatorial Ocean,* J.C.J. Nihoul, editor, Elsevier Scientific. Publishing Company, Amsterdam, Holland, pp. 1–15.

McPhaden, M.J., G. Reverdin, Y. du Penhoat, and A. Kartavtseff, 1982: Analyse optimale du champ de temperature pour le Programme FOCALE. Laboratoire d'Oceanographie Physique, Museum National d'Histoire Naturelle, Rapport Interne no. 82-03.

Knox, R.A. and M.J. McPhaden, 1979: Vertical profiles of temperature, salinity and density from NORPAX POLE experiment. Scripps Institution of Oceanography Technical Reference #79-6.

Knox, R.A. and M.J. McPhaden, 1976: Profiles of velocity and temperature near the Indian Ocean equator. Scripps Institution of Oceanography Technical Reference #76-11.

McPhaden, M.J., 1976: Monthly averaged current and temperature profiles near Gan. INDEX Occasional Note, No. 6, Nova University, Ft. Lauderdale, Florida.