

Michael James McPhaden

NOAA/Pacific Marine Environmental Laboratory
 7600 Sand Point Way NE
 Seattle, Washington 98115
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PROFESSIONAL EXPERIENCE

| | |
|--------------|---|
| 2007–present | Director, Global Tropical Moored Buoy Array (GT MBA) 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

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|------|---|
| 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

Top 100 World's Best Earth Science Scientists List (Research.com), 2023
 Listed in Web of Science as Highly Cited Researcher in Cross-Field (Interdisciplinary) Science, 2019, 2020, 2021, 2022, 2023
 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

Ayden van den Berg, Ph.D., TBD
Yakelyn Ramos Jauregui, Ph.D. 2024
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, Visakhapatnam, 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 Baldrige*, 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

Jiang, N., C. Zhu, Z. Z Hu, M. J. McPhaden et al., 2024: Enhanced risk of record-breaking regional temperatures during the 2023–24 El Niño. *Sci. Rept.* 14, 2521. <https://doi.org/10.1038/s41598-024-52846-2>

Oh, J.-H., J.-S. Kug, S.-I. An, F.-F. Jin, M. J. McPhaden, and J. Shin, 2024: Emergent climate change patterns originating from deep ocean warming in climate mitigation scenarios. *Nature Climate Change*. <https://doi.org/10.1038/s41558-024-01928-0>

Sprintall, J., M. Nagura, J. Hermes, M. K. Roxy, M. J. McPhaden, E. Pattabhi Ram Rao, T. Srinivasa Kumar, S. Thurston., J. Li, M. Belbeoch, and V. Turpin, 2024: COVID Impacts Cause Critical Gaps in the Indian Ocean Observing System. *Bull. Amer. Meteor. Soc.*, 105, E725–E741, <https://doi.org/10.1175/BAMS-D-22-0270.1>.

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>

Capotondi, A., S. McGregor, S., M. J. McPhaden, et al., 2023: Mechanisms of tropical Pacific decadal variability. *Nature Rev. Earth Environ.* <https://doi.org/10.1038/s43017-023-00486-x>

Connell, K.J., M.J. McPhaden, G.R. Foltz, R.C. Perez, and K. Grissom. 2023. Surviving piracy and the coronavirus pandemic. *Oceanography* 36(2–3):44–45, <https://doi.org/10.5670/oceanog.2023.212>.

- Geng, T., F. Jia, W. Cai, L. Wu, Bolan Gan, Z. Jing, S. Li, and M. J. McPhaden, 2023: Increased occurrences of consecutive La Niña events under global warming. *Nature*, 619, 774-781.
- Guan, C., F. Tian, M. J. McPhaden, S. Hu, and F. Wang, 2023: Zonal structure of tropical Pacific surface salinity anomalies affects the eastern and central Pacific El Niños differently. *Geophysical Research Letters*, 50, e2023GL105554. <https://doi.org/10.1029/2023GL105554>
- Jarugula, S., and M. J. McPhaden, 2023: Indian Ocean Dipole affects eastern tropical Atlantic salinity through Congo River Basin hydrology. *Nature Comm. Earth Environ.* 4, 366. <https://doi.org/10.1038/s43247-023-01027-6>
- 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>
- Li, X., Z.-Z. Hu, M. J. McPhaden, C. Zhu, and Y. Liu, 2023: Triple-Dip La Niñas in 1998-2001 and 2020-2023: Impact of Mean State Changes. *J. Geophys. Res.*, 128, e2023JD038843. <https://doi.org/10.1029/2023JD038843>
- McClure, M.M., C.L. Sabine, R.A. Feely, S.R. Hammond, C. Meinig, M.J. McPhaden, P.J. Stabeno, and E. Bernard. 2023. The history and evolution of PMEL: Purposeful research that impacts environmental policy. *Oceanography* 36(2-3):10-25, <https://doi.org/10.5670/oceanog.2023.235>.
- McPhaden, M. J., 2023: The 2020–22 triple-dip La Niña [in “State of the Climate in 2022”]. *Bull. Amer. Meteor. Soc.*, 104 (9), S157–S158, <https://doi.org/10.1175/BAMS-D-23-0090.1>.
- McPhaden, M.J., K.J. Connell, G.R. Foltz, R.C. Perez, and K. Grissom. 2023. Tropical ocean observations for weather and climate: A decadal overview of the Global Tropical Moored Buoy Array. *Oceanography* 36(2-3):32-43, <https://doi.org/10.5670/oceanog.2023.211>.
- 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.
- Nagura, M., and M. J. McPhaden, 2023: Dual-Frequency Wind-Driven Mixed Rossby–Gravity Waves in the Equatorial Indian Ocean. *J. Phys. Oceanogr.*, 53, 1535–1553, <https://doi.org/10.1175/JPO-D-22-0222.1>.
- Wang, B., W. Sun, C. Jin, X. Luo, Y.-M. Yang, T. Li, B. Xiang, M. J. McPhaden, M. A. Cane, F.-F. Jin, F. Liu and J. Liu 2023: Understanding the recent increase in multiyear La Niñas. *Nature Climate Change*, 13, 1075–1081. <https://doi.org/10.1038/s41558-023-01801-6>
- Zhang, L., C. Wang, W. Han, M. J. McPhaden, A. Hu, W. Xing, 2023: Emergence of the Central Atlantic Niño. *Sci. Adv.* 9, eadi5507. DOI: 10.1126/sciadv.adi5507
- 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:10.1088/1748-9326/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 cross-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. Krahnemann, 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>.
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