

Dr. Ryan Mahony Holmes

Climate Change Research Centre, University of New South Wales, Sydney

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Education

Doctor of Philosophy, Stanford University U.S.A. 2011–2016

Department of Earth System Science, GPA: 4.084/4

Physical oceanography, ocean modelling and equatorial dynamics. Supervisor: Professor Leif Thomas.

Bachelor of Philosophy (Honours), Australian National University 2006–2010

First class honours 95/100 with University medal.

Research-focused science degree with emphasis on theoretical physics. Honours thesis in computational physical chemistry.

Experience

Academic Positions.....

Senior Research Associate, University of New South Wales 2018+

School of Mathematics and Statistics (50%) and ARC Centre of Excellence for Climate Extremes (50%)

Two academic level B postdoc positions working on ocean physics, numerical mixing in ocean models and abyssal circulation theory. International collaborations (France, USA). Supervisors: Professors Trevor McDougall and Matthew England

Research Associate, University of New South Wales 2016–2017

Climate Change Research Centre

Academic level A postdoc position working on ocean physics and modelling. Contributed to development of the Australian community ocean model ACCESS-OM2 and a high-impact study published in Nature Climate Change. Supervisor: Professor Matthew England

Postdoctoral Fellow, University of New South Wales 2016

School of Mathematics and Statistics

Six-month academic level A postdoc position working on abyssal ocean mixing and circulation. Contributed to a high-impact study published in Nature. Supervisor: Professor Trevor McDougall

Student Supervision.....

Cosupervisor for three Ph.D. projects, University of New South Wales 2019+

David Webb (2016+), Shweta Sharma (2019+) and Maurice Huguenin-Virchaux (2019+)

Masters project main supervisor, University of New South Wales 2017-2018

Maurice Huguenin-Virchaux, Mechanisms driving ocean heat uptake variability over El Nino events

Teaching.....

Lecturer, University of New South Wales 2019

MSCI2001: Introductory Marine Science

Two weeks of introductory Physical Oceanography lectures. Material/assessment development. Led 4-day field trip project.

Guest Lecturer, University of New South Wales 2017-2019

CLIM2001, CLIM3001 fundamental climate courses, MATH3261-Fluids, Oceans & Climate

Publications

18 peer-reviewed articles (+2 in review), web-of-science h-index 7, citations 136 (62 in 2019)

Top 10 journal publications:.....

- **Holmes, R.**, Zika, J., Ferrari, R., Thompson, A., Newsom, E. and England, M. (2019) Atlantic ocean heat transport enabled by Indo-Pacific heat uptake and mixing, **Geophys. Res. Lett.**, accepted.
- de Lavergne, C., Madec, G., Roquet, F., **Holmes, R.** and McDougall, T. (2017) Abyssal ocean overturning shaped by seafloor distribution, **Nature**, 551, 181-186
- Spence, P., **Holmes R.**, Hogg A., Griffies, S., Stewart K. and England, M. (2017) Localized rapid

- warming of West Antarctic subsurface waters by remote winds, **Nature Climate Change**, 7, 595-603
- **Holmes R.**, de Lavergne, C. and McDougall, T. (2019) Tracer transport within abyssal mixing layers, **J. Phys. Oceanogr.**, 49, 2669–2695.
 - **Holmes R.**, Zika, J. and England M. (2019) Diathermal Heat Transport in a Global Ocean Model, **J. Phys. Oceanogr.**, 49, 141-161.
 - Webb, D., **Holmes R.**, Spence, P. and England, M. (2019) Quantification of Kelvin wave-induced subsurface warming along the West Antarctic Peninsula, **J. Geophysical Research**, 124, 1595-1615.
 - **Holmes R.**, McGregor, S., Santoso, A. and England, M. (2019) Contribution of Tropical Instability Waves to ENSO Irregularity, **Climate Dynamics**, 52, 1837-1855.
 - Warner S., **Holmes R.**, McHugh Hawkins E. Hoecker-Martinez, M., Savage, A. and Moum J. (2018), Buoyant Gravity Currents Released from Tropical Instability Waves, **J. Phys. Oceanogr.**, 48, 361-382
 - **Holmes R.**, Moum J. and Thomas L. (2016) Evidence for Seafloor-Intensified Mixing by Surface-Generated Equatorial Waves, **Geophys. Res. Lett.** 43, 1202-1210
 - **Holmes R.** and Thomas L. (2015) The Modulation of Equatorial Turbulence by Tropical Instability Waves in a Regional Ocean Model, **J. Phys. Oceanogr.** 45, 1155-1173

Grants and Funding

NOAA Climate Variability and Predictability Program Grant	2018-2020
<i>National Centre for Atmospheric Research, USA</i>	<i>USD\$572,950</i>
D. Whitt, S. Bachman, R-C Lien, W. Large and R. Holmes. Simulations and analysis of mesoscale to turbulence scale process models to facilitate observational process deployments in the Equatorial Pacific Cold Tongue.	

Awards

Nominee to attend the Lindau Nobel Laureates Meeting	2017
<i>Australian Academy of Science</i>	
Invited participant, Physical Oceanography Dissertation Symposium	2016
<i>National Science Foundation</i>	
Stanford University Graduate Fellowship	2012–2015
<i>Stanford University</i>	
Australian National University Medal in Physics	2010
<i>Australian National University</i>	

Selected Conferences and Talks

- Global ocean heat transport and mixing in the eastern tropical Pacific, 2019, **Three one-hour seminars at LOCEAN Paris, IGD Grenoble and LEGOS Toulouse**, France
- Tracer transport within abyssal mixing layers, 2018, **Talk at the bottom turbulence workshop, Massachusetts Institute of Technology**, USA
- Dianeutral circulation in the abyss: Tracer transport and the role of seafloor geometry, 2018, **Seminar at the National Centre for Atmospheric Research**, Colorado, USA
- Ocean heat transport in temperature coordinates and what it can tell us about ocean processes and their role in climate, 2018, **Job talk, Research School of Earth Sciences**, Australian National University
- Water mass transformation techniques applied to two problems in oceanography, 2018, **College of Oceanic and Atmospheric Sciences Seminar**, Oregon State University, USA
- Eddies, waves and internal variability in the tropical Pacific Ocean: Implications for the El Nino - Southern Oscillation, 2016, **Invited Talk at the ARC COE for Climate System Science Workshop**.
- Tropical Instability Waves and Mixing in the Equatorial Pacific Ocean, 2016, **Physical Oceanography Dissertation Symposium Meeting Talk** University of Hawaii, USA