

# 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 Nature Climate Change study. 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 Nature study. 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 130 (51 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, **Geophysical Research Letters**, 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, **Geophysical Research Letters** 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

National Centre for Atmospheric Research, USA

USD\$572,950

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

Australian Academy of Science

### Invited participant, Physical Oceanography Dissertation Symposium

2016

National Science Foundation

### Stanford University Graduate Fellowship

2012–2015

Stanford University

### Australian National University Medal in Physics

2010

Australian National University

## 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