Kay McMonigal (he/him or they/them)
Postdoctoral scholar
Department of Marine, Earth, and Atmospheric Sciences
North Carolina State University
email: ktmcmoni@ncsu.edu
website: kmcmonigal.github.io
phone: 305-537-8667

EDUCATION

2020 **Ph.D.**, University of Miami (UM) Rosenstiel School of Marine and Atmospheric Sciences (RSMAS)
Meteorology and Physical Oceanography
Dissertation: *Estimating a time-series of South Indian Ocean heat transport*
Advisor: Lisa Beal

2015 B.A., Northwestern University
Earth and Planetary Sciences, Math, Integrated Sciences, minor: Gender Studies

EMPLOYMENT

2022 Visiting Instructor
Duke University, teaching course: *The Earth System*

2020 - Postdoctoral Scholar
MEAS, North Carolina State University. Advisor: Sarah Larson

2015 - 2020 Graduate Research Assistant
University of Miami RSMAS

2014 - 2015 Undergraduate Research Assistant
Northwestern University Earth and Planetary Sciences (EPS)

PUBLICATIONS - PEER REVIEWED

[5] **McMonigal, K.**, K. Gunn, L.M. Beal, S. Elipot, J.K. Willis, Convergent Indian Ocean heat transport drives recent warming. DOI: 10.1175/JPO-D-21-0085.1. In press with *Journal of Physical Oceanography.*

[4] **McMonigal, K.**, S. Larson (2022), ENSO explains the link between Indian Ocean Dipole and ocean meridional heat transport, *Geophysical Research Letters, 49.* DOI: 10.1029/2021GL095796.

[3] **McMonigal, K.**, L.M. Beal, S. Elipot, K. Gunn, T. Morris, J. Hermes, A. Houk (2020): The impact of meanders, deepening and broadening, and seasonality on Agulhas Current temperature variability, *Journal of Physical Oceanography,* **50** (12). DOI: 10.1175/JPO-D-20-0018.1

[2] Gunn, K.L., L.M. Beal, S. Elipot, **K. McMonigal**, A. Houk (2020): Mixing of subtropical, central and intermediate waters driven by shifting and pulsing of the Agulhas Current, *Journal of Physical Oceanography,* **50** (12). DOI: 10.1175/JPO-D-20-0093.1

[1] **McMonigal, K.**, L.M. Beal, and J.K. Willis (2018): The seasonal cycle of the south Indian Ocean subtropical gyre circulation as revealed by Argo and satellite data, *Geophysical Research Letters*, **45** (17). DOI: 10.1029/2018GL078420

PUBLICATIONS - IN PREPARATION

[3] Gunn, K.L., **K. McMonigal**, L.M. Beal, S. Elipot, E. McDonagh, Indian Ocean remains net evaporative. In prep for submission to *Journal of Physical Oceanography.*

[2] Larson, S., **K. McMonigal,** C. Deser, D. Amaya, I. Simpson, A. Clement, Y. Okumura, A. Capotondi, D. Bailey, K. Bellomo. A mechanically decoupled version of the community earth system model version 2 (CESM2).

[1] Gunn, K.L., **K. McMonigal**, L.M. Beal, S. Elipot, Eddy heat fluxes within the Agulhas Current.

PUBLICATIONS - OTHER

Corrigendum to McMonigal et al., (2020). In press with *Journal of Physical Oceanography.*

Corrigendum to Gunn et al., (2020). In press with *Journal of Physical Oceanography.*

INVITED TALKS

2021 *Why is the Indian Ocean warming so rapidly?*
George Mason University, Fairfax, VA (virtual)

2021 *Convergence Indian Ocean heat transport drives recent warming*
CASPO seminar, Scripps Institute of Oceanography, San Diego, CA (virtual)

SELECTED SCIENTIFIC PRESENTATIONS

2022 *ENSO explains the link between Indian Ocean Dipole and meridional heat transport*
Ocean Sciences Meeting (virtual, March 3)

2022 *Why is the Indian Ocean warming so rapidly?*
South African Network for Coastal and Oceanic Research seminar (Jan 31)

2022 *Why is the Indian Ocean warming so rapidly?*
Woods Hole Oceanographic Institute seminar series (Jan 25)

2022 *Why is the Indian Ocean warming so rapidly?*
Northwestern University Earth and Planetary Sciences seminar (Jan 14)

2021 *Estimating a time series of South Indian Ocean heat transport*
Physical Oceanography Dissertation Symposium, HI

2021 *Drivers of Indian and Pacific Ocean heat transport*
International Workshop for Air-sea Interactions (virtual poster)

2020 *Estimating a time series of meridional heat transport of the Indian Ocean at 34°S*
Ocean Sciences Meeting, San Diego, CA

2020 *Variability in Agulhas Current temperature and freshwater transports, with implications for Agulhas Leakage fluxes*
Gateways to the Ocean Symposium, San Diego, CA

2019 *The time varying temperature transport of the Agulhas Current*
IUGG Assembly, Montreal, Canada

2018 *The seasonal cycle of the South Indian Ocean subtropical gyre as revealed by Argo and satellite data*
National Oceanography Centre, Southampton, UK

2018 *The seasonal cycle of the South Indian Ocean subtropical gyre as revealed by Argo and satellite data*
University of Cape Town, South Africa

2018 *The seasonal cycle of the South Indian Ocean subtropical gyre (poster)*
Statewide Graduate Research Symposium, Florida State University

2018 *The seasonal cycle of the South Indian Ocean subtropical gyre*
University of Miami, Graduate Research Symposium

2017 *Meridional heat transport of the Indian Ocean across 34°S based on high resolution Agulhas Current hydrography, satellite, and Argo data*
IAPSO-IAMAS-IAGA Joint Assembly, Cape Town, South Africa

2014 *Calcite rafts-rapid deposition of transgressive infill cave sequences as a new paleo sea level proxy (poster)*
Geological Society of America, Vancouver, CA

FUNDED GRANTS

2019 **K. McMonigal**: Mary Roche Scholarship. University of Miami. $10,000

2018 **K. McMonigal**: *Elevating diversity and inclusion at RSMAS.* University of Miami Career Development Fund. $2,500.

AWARDS & SCHOLARSHIPS

2019 Mary Roche Scholarship, University of Miami
2018 Best physical sciences presentation, Graduate Student Research Symposium, UM
2017 RSMAS Career Development Award, University of Miami
2015 - 2020 University of Miami Graduate School Fellowship
2015 Scymour Schlanger Undergraduate Earth Science Award, EPS
2012 Academic All-Big Ten Student Athlete

SEAGOING EXPERIENCE

2020 FLOTSAM undergraduate cruises, RV Walton Smith, Florida Straits, Chief Scientist: Jim Happell. Two one day cruises. CTD operations and plankton tows.

2019 GO-SHIP I06S, RV Thomas G Thompson, Indian/Southern Ocean, Chief Scientist: Alex Orsi. 42 days. CTD operations, drifter and float deployment.

2018 Agulhas System Climate Array (ASCA), SA Agulhas, Indian Ocean, Chief Scientist: Lisa Beal. 14 days. Mooring recovery, CTD operations.

2016 ASCA, RV Algoa, Indian Ocean, Chief Scientist: Lisa Beal. 14 days. Mooring deployment, CTD operations.

TEACHING EXPERIENCE

Instructor

2022 *The Climate System*, Duke University (Fall semester)
Anticipated 25 students, mostly graduate with a few undergrad

2020 *Introduction to Physical Oceanography*, UM
In person instructor for hybrid course. Lead instructor: Lisa Beal

2019 *Basic Dynamical Oceanography,* University of Cape Town
Two week intensive at Honours level (1 year degree post BS)

Guest Lecturer

2022 *Introduction to Coastal Environments*, NCSU. Instructor: Christopher Osborne
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2019 *Climate Change*, UM. Instructor: Amy Clement

Teaching Assistant

2018 *Environmental Oceanography*, UM. Instructor: Pamela Reid

2016 *Climate and Global Change*, UM. Instructor: Igor Kamenkovich

Other Teaching Experience

2019 University of Miami Teaching Academy

2016 - 2019 Tutor, Tutorial Resources. Math, sciences, English for grades 6-12

Mentoring

Henry Goff, undergraduate student, NCSU
Henry is working on the relationship between southern hemisphere trends in SSTs and winds from two large ensemble experiments. I am directing the scientific direction of his work and taught him to use the HPC system. We meet weekly.

Jenna Wilkie and Michael Fredericks, graduate students, NCSU Statistics department
As a consulting project for their statistics degrees, Jenna and Michael are investigating changes in air temperature over the historical record from two large ensemble experiments. I was involved in the scientific question generation and in managing their progress. We meet biweekly.

Mahdi Hasan, PhD student, NCSU
Mahdi is working on projected Hadley cell expansion and its impacts on ocean circulation using CMIP models. I meet with him weekly to discuss science results and monitor his progress.

Sam Michlowitz, MS student, NCSU
Sam is working on storm dynamics in a model hierarchy. I have assisted her in learning the HPC systems and working with model output.

Kaitlyn Woznick, undergraduate student, University of Wisconsin-Madison
Kaitlyn is applying to graduate programs in paleontology and paleoclimate. We meet biweekly to help Kaitlyn prepare their applications.

Lauren Pressley, undergraduate student, NCSU
Lauren worked for 1 semester on understanding the drivers of wintertime tropical instability waves in the Atlantic.

SERVICE & OUTREACH

Reviewer for *Geophysical Research Letters*, *Scientific Reports*, *Journal of Geophysical Research: Oceans*, *Atmosphere*, *Ocean Sciences*, *Communications Earth & Environment*, IPCC AR6 report.
Maintaining an Environment of Respect Aboard Ships (MERAS) committee member (UNOLS), 2021-present
International Association for the Physical Sciences of the Ocean, Early Career Scientist working group, committee member, 2019-present
Geosciences Education & Mentorship Support mentor
Unlearning Racism in Geosciences (URGE) Pod member, 2021
University of Miami RSMAS Student-Led Evaluations and Development, committee member

Ocean Sciences Bowl 2020 volunteer
Ocean Kids program 2019 volunteer

RESEARCH EXPERIENCE
CTD operations and sampling
Mooring deployment and recovery
Set up, calibration, quality control, and analysis of hydrographic data from CTDs, microCATs, CPIES, ADCPs, Nortek current meters
Interpolation of disparate data sources including mooring, Argo, and satellite
HPC usage
Programing with Matlab, python, cdo, NCL, shell, C++
Processing of CCSM and CESM ocean, atmosphere, and sea ice output
Running CESM including coupler modifications and large ensembles
Writing workshop with Dallas Murphy, 2018
Mentoring workshop with Merlin Wahlberg, 2018

PROFESSIONAL MEMBERSHIPS
American Meteorological Society, member
The Oceanography Society, member
American Geophysical Union, member

REFERENCES
Lisa Beal, Professor
lbeal@rsmas.miami.edu

Sarah Larson, Assistant Professor
slarson@ncsu.edu

Rana Fine, Professor Emeritus
rfine@rsmas.miami.edu

Josh Willis, Project Scientist
joshua.k.willis@jpl.nasa.gov