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EDUCATION

2016	**Ph.D.**, University of Miami Rosenstiel School of Marine and Atmospheric Science (RSMAS) Meteorology & Physical Oceanography Dissertation: *ENSO Predictability*
2011	**B.S.**, University of South Alabama Meteorology

EMPLOYMENT

2018 –	Assistant Professor MEAS, North Carolina State University
2016 – 2018	NOAA Climate & Global Change Postdoctoral Fellow University of Wisconsin – Madison
2016	Postdoctoral Researcher University of Miami Cooperative Institute for Marine & Atmospheric Science (CIMAS)
2011 – 2016	Graduate Research Assistant & Graduate School Fellow University of Miami RSMAS
2010	NOAA Ernest F. Hollings Undergraduate Scholar NOAA Atlantic Oceanographic & Meteorological Laboratory (AOML), Miami, FL

AWARDS & SCHOLARSHIPS

2016	NOAA Climate & Global Change Postdoctoral Fellowship
2016	F. G. Walton Smith Prize, University of Miami, annual award for outstanding PhD dissertation
2016	Outstanding Oral Presentation, 96th AMS Annual Meeting, Climate Variability & Change
2015	RSMAS Career Development Award, University of Miami
2013	Best Student Seminar in Meteorology & Physical Oceanography, University of Miami
2011 – 2016	University of Miami Graduate School Fellowship
2011	Outstanding Senior in Meteorology, University of South Alabama
2010	Dr. Bill Williams Scholarship in Meteorology, University of South Alabama
2010	Outstanding Presentation, NOAA Headquarters Student Science & Ed. Symposium
2009 – 2011	NOAA Ernest F. Hollings Scholarship

PUBLICATIONS

In Progress (graduate student or postdoc underlined)

[27] McMonigal, K., **S. M. Larson**, and S. Hu: Wind driven ocean redistribution of heat leads to increased anthropogenic warming over 1979-2014, in prep.

[26] Sutton, M., **S. M. Larson**, and E. J. Becker: ENSO reduces interannual mid-level atmospheric variability over North America, *Climate Dynamics*, in prep.

[25] Hasan, M., **S. M. Larson**, and K. McMonigal: Future changes in the role of Ekman heat flux on SST variability, *Geophysical Research Letters,* submitted.

[24] **Larson, S. M.**, K. McMonigal, Y. Okumura, D. Amaya, A. Capotondi, K. Bellomo, I. R. Simpson, and A. C. Clement.: Ocean realism shapes seas surface temperature variability in a CESM2 coupled model hierarchy, *Journal of Advances in Modeling Earth Systems*, submitted.

[23] Shu, Q., Y. Zhang, D. J. Amaya, **S. M. Larson**, Y. Kosaka, J.-C. Yang, and X. Lin: Role of Ocean Advections during the Equatorward Propagation of the Pacific Meridional Modes, *Journal of Climate*, in review.

Peer-Reviewed (graduate student or postdoc underlined)

[22] Zhang, Y., S. Yu, S.-P. Xie, D. J. Amaya, Q. Peng, Y. Kosaka, X. Lin, J.-C. Yang, **S. M. Larson**, and A. J. Miller (2022): Role of ocean dynamics in equatorial Pacific decadal variability, *Climate Dynamics*, accepted.

[21] Lee, S.-K., H. Lopez, G. R. Foltz, D. Kim, **S. M. Larson**, E.-P. Lim, K. Pujiana, D. L. Volkov, S. Chakravorty, and F. A. Gomez. (2022): Java-Sumatra Niño/Niña and associated regional rainfall variability, *Journal of Climate*, accepted.

[20] **Larson, S. M**., Y. Okumura, K. Bellomo, and M. Breeden (2022): Destructive interference of ENSO on North Pacific SST and North American precipitation associated with Aleutian low variability. *Journal of Climate,* 35, 3567-3585.

[19] McMonigal, K, and **Larson, S. M.** (2022): ENSO explains the link between Indian Ocean Dipole and meridional ocean heat transport. *Geophysical Research Letters*, 49, e2021GL095796.

[18] Chakravorty, S., R. C. Perez, B. T. Anderson, **S. M. Larson**, B. S. Giese, and V. Pivotti (2021): Ocean dynamics are key to extratropical forcing of El Nino. *Journal of Climate*, 24, 8739-8753.

[17] Zhang, Y., S. Yu, D. J. Amaya, Y. Kosaka, **S. M. Larson**, X. Wang, J.-C. Yang, M. F. Stuecker, S.-P. Xie, A. J. Miller, and X. Lin (2021): Pacific Meridional Modes without Equatorial Pacific Influence. *Journal of Climate*, 34, 5285-5301.

[16] Chakravorty, S., R. C. Perez, B. T. Anderson, B. S. Giese, **S. M. Larson**, and V. Pivotti (2020): Testing the trade wind charging mechanism and its influence on ENSO variability. *Journal of Climate,* 33, 7391-7411.

[15] Capotondi, A., C. Deser, A. S. Phillips, Y. Okumura, and **S. M. Larson** (2020): ENSO and Pacific Decadal Variability in the Community Earth System Model Version 2. *Journal of Advances in Modeling Earth Systems*, e2019MS002022.

[14] Pegion, K., C. M. Selman, **S. M. Larson**, J. C. Furtado, and E. J. Becker (2020): The Impact of the Extratropics on ENSO Diversity and Predictability. *Climate Dynamics,* 54, 4469-4484.

[13] **Larson, S. M.**, M. Buckley, and A. Clement (2020): Extracting the Buoyancy-Driven Atlantic Meridional Overturning Circulation. *Journal of Climate*, 33, 4697-4714.

[12] **Larson, S. M.**, and K. V. Pegion (2020): Do asymmetries in ENSO predictability arise from different recharged states? *Climate Dynamics*, 54, 1507-1522.

[11] Small, R. J., F. O. Bryan, S. P. Bishop, **S. M. Larson,** and R. A. Tomas (2020): What Drives Upper-Ocean Temperature Variability in Coupled Climate Models and Observations? *Journal of Climate*, 33, 577-596.

[10] **Larson, S. M.**, and B. P. Kirtman (2019): Linking Preconditioning to Extreme ENSO events and reduced ensemble spread. *Climate Dynamics: Special Collection on ENSO Diversity,* 52, 7417-7433.

[9] **Larson, S. M.**, K. V. Pegion, and B. P. Kirtman (2018): The South Pacific Meridional Mode as a thermally-driven source of ENSO amplitude modulation and uncertainty. *Journal of Climate*, 31, 5127-5145.

[8] **Larson, S. M.**, D. J. Vimont, A. Clement, and B. P. Kirtman (2018): How momentum coupling affects SST variance and large-scale Pacific climate variability in CESM. *Journal of Climate*, 31, 2927-2944.

[7] **Larson, S. M.**, B. P. Kirtman, and D. J. Vimont (2017): A Framework to Decompose Wind-driven Biases in Climate Models Applied to CCSM/CESM in the Eastern Pacific, *Journal of Climate*, 30, 8763-8782.

[6] **Larson, S. M.**, and B. P. Kirtman (2017): Drivers of coupled model ENSO error growth dynamics and the spring predictability barrier. *Climate Dynamics*, 48, 3631-3644.

[5] **Larson, S. M.**, and B. P. Kirtman (2015): An alternate approach to ensemble ENSO forecast spread: Application to the 2014 forecast. *Geophys. Res. Lett*., 42, 9411–9415.

[4] **Larson, S. M**., and B. P. Kirtman (2015): Revisiting ENSO Coupled Instability Theory and SST Error growth in a fully coupled model. *Journal of Climate*, 28, 4724–4742.

[3] **Larson, S. M**, and B. P. Kirtman (2014): The Pacific Meridional Mode as an ENSO Precursor and Predictor in the North American Multi-Model Ensemble. *Journal of Climate*, 27, 7018-7032.

[2] **Larson, S. M.**, and B. Kirtman (2013): The Pacific Meridional Mode as a trigger for ENSO in a high-resolution coupled model. *Geophys. Res. Lett*., 40, 3189–3194.

[1] **Larson, S. M.**, S.-K. Lee, C. Wang, E.-S. Chung, and D. Enfield (2012): Impacts of non-canonical El Niño patterns on Atlantic hurricane activity. *Geophys. Res. Lett*., 39, L14706.

Other

Larson, S. M. and K. Pegion, (2021): Do asymmetries in ENSO predictability arise from different recharged states? Extended Summary, Climate Prediction S&T Digest, 45th NOAA Climate Diagnostics and Prediction Workshop, Virtual Online, DOC/NOAA, 11. DOI: 10.25923/tpfe-4n87.

Kirtman, B., J. Infanti, and **S. Larson** (2013): The diversity of El Niño in the North American multi-model prediction system. *US CLIVAR Variations,* 11, 18-23.

SCIENTIFIC PRESENTATIONS

2020-present (graduate student or postdoc underlined)

2022 McMonigal, K., **S. M. Larson**, and S. Hu: Wind Driven Ocean Redistribution of Heat Leads to Increased Anthropogenic Surface Warming over 1979-2014 in CESM2, AGU Fall Meeting, Chicago, IL.

2022 Hasan, M., **S. M. Larson**, and K. McMonigal: Future Changes in the Role of Ekman Heat Flux on SST Variability, AGU Fall Meeting, Chicago, IL.

2022 **Larson, S. M.,** Y. Okumura, K. Bellomo, and M. Breeden: Destructive Interference of ENSO on North American Precipitation Associated with Aleutian Low/PNA Variability, AGU Fall Meeting, Chicago, IL.

2022 Bellomo, K., V. L. Meccia, R. D'Agostino, F. Fabiano, **S. M. Larson**, O. Mehling, J. von Hardenberg, S. Corti: Precipitation impacts of a weaker AMOC over the Euro-Atlantic region in the EC-Earth3 climate model, AGU Fall Meeting, Chicago, IL.

2022 McMonigal, K., M. Buckley, O. Gozdz, and **S. M. Larson**: *Drivers of Atlantic SST variability in a coupled model hierarchy*, AMS Atmospheric and Oceanic Fluid Dynamics conference, Breckenridge, CO, 2022.

2022 McMonigal, K., and **S. M. Larson**: *Anthropogenically forced wind driven ocean redistribution of heat leads to increased warming over the historical period*, US CLIVAR Pattern Effect Workshop, Boulder, CO, 2022.

2022 Hasan, M., **S. M. Larson,** and K. McMonigal: *Future Changes in the Role of Ekman Heat Flux on Pacific SST Variability*, NCAR Climate Variability and Change Working Group, CESM Annual workshop, virtual.

2022 Hasan, M., **S. M. Larson,** and K. McMonigal: *Future Changes in the Role of Ekman Heat Flux on Pacific SST Variability*, George Mason University Graduate Student Symposium, Fairfax, VA.

2022 **Larson, S. M.**: *Using coupled models to better understand the ocean's role in extra-tropical climate variability,* George Mason University, Atmosphere, Ocean, and Earth Sciences Department Seminar, virtual (invited).

2022 **Larson, S. M.**: *Using coupled models to better understand the ocean's role in extra-tropical climate variability,* NASA Global Modeling and Assimilation Office, Seminar Series on Earth System Science, virtual (invited).

2022 McMonigal, K., and **S. M. Larson:** *ENSO explains the link between Indian Ocean Dipole and meridional ocean heat transport,* NCAR Climate Variability and Change Working Group winter meeting, virtual.

2022 McMonigal, K., and **S. M. Larson:** *ENSO explains the link between Indian Ocean Dipole and meridional ocean heat transport,* AGU Ocean Sciences, virtual.

2021 Hasan, M., **S. M. Larson,** and K. McMonigal**:** *Air-Sea Interaction Plays a Different Role in North Pacific Turbulent Heat Flux Exchange in Summer Versus Winter*, AGU Fall Meeting, New Orleans, LA.

2021 **Larson, S. M.**: *Subtropical Pacific SST variability: insights on forcings and links to the tropics*, University of Hawaii, Department of Oceanography (invited).

2021 **Larson, S. M.**: *A coupled model hierarchy approach to studying climate variations in the midlatitudes*, WCRP-CLIVAR International Workshop for Mid-latitude Air-Sea Interaction, virtual (invited).

2021 Hasan, M., and **S. M. Larson:** *The seasonally varying relationship between air-sea fluxes and large-scale SST in a coupled model hierarchy*, WCRP-CLIVAR International Workshop for Mid-latitude Air-Sea Interaction, virtual.

2021 McMonigal, K., and **S. M. Larson:** *The role of ENSO on Pacific and Indian Ocean Heat Transport Variability in CESM1*, WCRP-CLIVAR International Workshop for Mid-latitude Air-Sea Interaction, virtual.

2021 Sutton, M. and **S. M. Larson**: *ENSO-Driven Suppression of Interannual Atmospheric Variability Over the United States*, NCAR Climate Variability & Change working group winter meeting.

2021 Zhang, Y., S. Yu, D. Amaya, Y. Kosaka, **S. M. Larson**, X. Wang, J.-C. Yang, M. Stuecker, S.-P. Xie, A. Miller, and X. Lin: *Pacific Meridional Modes without Equatorial Pacific Influence*, Asian Oceania Geosciences Society.

2021 **Larson, S. M.**, S.-K. Lee, and N. Johnson: *Untangling the Mechanisms of Indian Ocean Dipole Variability*, WCRP-CLIVAR Workshop on Climate Interactions among the Tropical Basins, virtual (invited).

2021 **Larson, S. M.**: *Collaborative insight from graduates with varied career paths,* AMS Student Conference, AMS Annual Meeting, virtual (invited).

2021 Sutton, M. and **S. M. Larson**: *ENSO-Driven Suppression of Interannual Atmospheric Variability Over the United States*, AMS Annual Meeting, virtual.

2020 Zhang, Y., S. Yu, D. Amaya, Y. Kosaka, **S. M. Larson**, X. Wang, J.-C. Yang, M. Stuecker, S.-P. Xie, A. Miller, and X. Lin: *Pacific Meridional Modes without Equatorial Pacific Influence*, AGU Fall Meeting, San Francisco, CA

2020 Chakravorty, S., R. Perez, B. Anderson, **S. M. Larson**, B. Giese, and V. Pivotti: *Extratropical Atmospheric Variability on El Nino: Contrasting Thermodynamic versus Dynamic Coupling*, AGU Fall Meeting, San Francisco, CA

2020 **Larson, S. M.**, M. Buckley, and A. Clement: *Momentum and Buoyancy Contributions to Atlantic Ocean Circulation Variability,* AGU Fall Meeting, San Francisco, CA (invited)

2020 **Larson, S. M.**, and K. Pegion: *The Southern Hemisphere as a Thermodynamic Modulator of ENSO Amplitude*, AGU Fall Meeting, San Francisco, CA

2020 **Larson, S. M.**, and K. Pegion: Do asymmetries in ENSO predictability arise from different recharged states? 45th NOAA Annual Climate Diagnostics and Prediction Workshop, virtual, 2020.

2020 **Larson, S. M.**, M. Buckley, and A. Clement: *Extracting the Buoyancy-Driven Atlantic Meridional Overturning Circulation*, AMS Annual Meeting, Boston, MA

Prior to 2020 (Larson as presenting/1st author only)

2019 *Can Oceanic Heat Content Predict ENSO in a Realistic Forecast Setting?* (invited)
AGU Fall Meeting, San Francisco, CA

2019 *Extracting the Buoyancy-Driven Atlantic Meridional Overturning Circulation*

AGU Fall Meeting, San Francisco, CA

2019 *The South Pacific Meridional Mode as a Source of ENSO Amplitude Modulation and Uncertainty* (invited)
Meridional Modes Workshop, Ohio State University

2019 *Air-sea interaction and Large-scale Sea Surface Temperature Variability* (invited)
Pennsylvania State University, State College, PA

2019 *A Process-Based Model Hierarchy to Decompose Climate Drivers* (invited)
NOAA Climate & Global Change Summer Institute, Steamboat Springs, CO

2019 *Why are long lead-time El Nino predictions challenging?* (keynote)
Southeastern Coastal & Atmospheric Sciences Symposium, University of South Alabama, Mobile, AL

2019 *The South Pacific Meridional Mode as a Thermally-Driven Source of ENSO Amplitude Modulation & Uncertainty*
AMS Annual Meeting, Phoenix, AZ

2018 *Impact of Momentum Coupling on Large-Scale Pacific and Atlantic Climate*
AGU Fall Meeting, Washington D. C.

2018 *Does the equatorial recharge/discharge increase ENSO predictability?* (invited)
International ENSO Conference, Guayaquil, Ecuador

2018 *How Momentum Coupling Affects SST Variance and Large-Scale Pacific Climate in CESM*
AGU Ocean Sciences Meeting, Portland, OR

2018 *The Impact of Internal Variability on ENSO Predictability* (invited)
University of Victoria, Victoria, BC, Canada

2018 *The Impact of Internal Variability on ENSO Predictability* (invited)
Indiana University Bloomington, Bloomington, IN

2018 *The Impact of Internal Variability on ENSO Predictability* (invited)
University of Massachusetts Lowell, Lowell, MA

2017 *A framework to decompose wind-driven biases in climate models applied to CCSM/CESM in the eastern Pacific* (poster)
AGU Fall Meeting, New Orleans, LA

2017 *Using a Mechanically Decoupled CESM to Study Climate* (invited)
National Center for Atmospheric Research (NCAR), Climate & Global Dynamics

2017 *The Impact of Internal Variability on ENSO Predictability* (invited)
North Carolina State University, Raleigh, NC

2017 *Linking Preconditioning to Extreme El Niño and ENSO Predictability*
AMS Annual Meeting, Seattle, WA

2016 *Linking Preconditioning to Extreme El Niño and ENSO Predictability*
AGU Fall Meeting, San Francisco, CA

2016 *ENSO Predictability in a Fully Coupled Model* (invited)
Yale University, New Haven, CT

2016 *The Pacific Meridional Mode as an ENSO Precursor & Predictor in the NMME*
AMS Annual Meeting, New Orleans, LA

2015 *Revisiting coupled instability and SST error growth in a fully coupled model* (invited)
AGU Fall Meeting, San Francisco, CA

2015 *ENSO Predictability: Precursors versus perturbation growth* (invited)
University of Wisconsin – Madison, WI

2015 *Revisiting coupled instability and SST error growth in a fully coupled model*
Graduate Climate Conference, Woods Hole, MA

2015 *ENSO Predictability: Precursors versus perturbation growth* (invited)
University of California – Irvine, Irvine, CA

2015 *Revisiting coupled instability and SST error growth in a fully coupled model*
CLIVAR Workshop – Evaluation of ENSO in Climate Models: ENSO in a Changing Climate, Paris, France

2014 *Revisiting coupled instability and SST error growth in a fully coupled model*
AGU Fall Meeting, San Francisco, CA

2012 *Impacts of non-canonical El Niño patterns on Atlantic hurricane activity*
AGU Fall Meeting, San Francisco, CA

2011 *Impacts of non-canonical El Niño patterns on Atlantic hurricane activity*
NOAA Headquarters Student Science and Education Symposium, Silver Spring, MD

FUNDED PROPOSALS

At NCSU

2022 – 2025 *Collaborative Research: Determining the Role of Ocean Dynamics in Atlantic Sea Surface Temperature Variations. Using a Hierarchy of Coupled Models*
Role: Institutional PI; Lead PI: M. Buckley (GMU)
Agency: NSF Physical Oceanography, NCSU: $207,801

2022 – 2023 *Impact of Future Climate Events on NC Animal Agriculture Systems*
Role: Co-PI; Lead PI: S. Shashaani (NCSU Industrial and Systems Eng.)
Agency: NCSU Research and Innovation Seed Funding Program (RISF), $25,000.

2020 – 2023 *Mechanisms of Intrinsic and Anthropogenically Forced Climate Variations*
Role: PI
Agency: NSF Climate & Large-Scale Dynamics, NCSU: $643,860

Prior to NCSU

2016 – 2018 *Disentangling ENSO's Influence on Climate*
Role: PI
Agency: NOAA Climate & Global Change Postdoctoral Fellowship, UCAR, $150,000.

2016 *To conduct regional workshop on writing successful scientific grant proposals.*
Role: Co-PI (with Adeyemi Adeyibi)
Agency: University of Miami Career Development Fund, $2000.

2015 – 2017 *Revisiting Coupled Instability Theory and the Initiation of ENSO*.
Role: Proposal writer; Lead PI: B. Kirtman
Agency: NSF Climate & Large-Scale Dynamics, U. of Miami: $177,632.

TEACHING EXPERIENCE

2019-present Instructor, North Carolina State University
MEA 421 Atmospheric Dynamics 1 (3 times)

2019-present Instructor, North Carolina State University
MEA 593 Climate Predictability (4 times)

Guest Lecturer, Quantitative Analysis of Climate Change (2019, 2020)

Content Contributor, MEA 140 Catastrophic Earth (2019)

PROFESSIONAL DEVELOPMENT / INVITED WORKSHOPS

CLIVAR International workshop for mid-latitude air-sea interaction: advancing predictive understanding of regional climate variability and change across timescales (2021)
WCRP-CLIVAR Workshop on Climate Interactions among the Tropical Basins (2021)
SERC Early Career Geoscience Faculty Workshop (2020)
45th NOAA Annual Climate Diagnostics and Prediction Workshop (2020)
2nd Meridional Modes Workshop, Ohio State University (2019)

STUDENTS AND POSTDOCTORAL SCHOLARS SUPERVISED

Postdoctoral Scholars

2020 -present	Kay McMonigal

Graduate Students

2022 – present	Kaitlin Karaffa (M.S.) *co-advised with Kathie Dello*
2022 – present	Henry Goff (Ph.D.) *co-advised with Anantha Aiyyer*
2021 – present	Sam Michlowitz (M.S.)
2020 – present	Mahdi Hasan (Ph.D.)
2021	Margaret Sutton (M.S.) *ENSO-Driven Impacts on Wintertime Climate Anomalies over North America*

Undergraduate Students

2021 – 2022	Henry Goff
2020 – 2021	Lauren Pressley

SERVICE (condensed)

Internal

2022 – present	Community Climate Committee
2022	Department of Marine, Earth, and Atmospheric Science Symposium Organizing Committee
2021	Pack Promise Coach
2020 – 2021	Cluster Hiring Committee
2020 – present	NCSU liaison for the Central NC Chapter of the American Meteorological Society: implemented graduate student lightning talks into monthly chapter meetings
2019 – present	Faculty Advisor: American Meteorological Society Student Chapter, NCSU
2018 – present	Web Committee
2018 – 2020	Computing Committee

External

2022 – 2025	Invited panelist, NCAR Computational and Informational Systems Laboratory (CISL) HPC Allocation Panel (CHAP): panel that accepts and reviews requests for large allocations of NCAR resources
2021 – present	Co-Chair, NCAR Climate Variability and Change working group
2021	Member, National Center for Atmospheric Research (NCAR) HPC User Group (NHUG)
2019 – 2022	Scientific Organizing Committee: "Prospects for Multi-year Climate Predictability and Societally-relevant Climate Predictions" Workshop, CLIVAR (COVID-19 delay)
2019 – present	Member, NCAR Climate Variability and Change working group

Professional Contributions

Journal Referee	*Climate Dynamics, Geophysical Research Letters, Journal of Climate, Journal of Geophysical Research – Atmospheres, Journal of Geophysical Research – Oceans, Nature, Nature Climatic*

Change, Weather and Forecasting, Progress in Oceanography, Progress in Oceanography, Nature Communications

Other Activities
American Geophysical Union, Member
American Meteorological Society, Member