SNIGDHA SAMANTARAY

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EDUCATION

Graduate Research Assistant (Ph.D.) *2022 – Present*

Department of Meteorology and Physical Oceanography

Rosenstiel School of Marine, Atmospheric, and Earth Science, University of Miami, FL, USA

5-year BS-MS dual degree (Major: Earth and Climate Sciences) *2016 – 2021*

Department of Earth and Climate Science CGPA: 7.8/10

Indian Institute of Science Education and Research (IISER), Pune, Maharashtra, India

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RESEARCH INTERESTS

Tropical Convection, Tropical Meteorology, Large scale circulation, Climate Modelling, Atmospheric Dynamics

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RESEARCH EXPERIENCE

Investigating the Water Vapor Lake Forming over the Western Indian Ocean *2022 – Present*

Advisor: Dr. Brian Mapes, Department of Atmospheric Sciences, University of Miami, FL, USA

- Analyze multiple atmospheric water vapor lake events using MERRA-2 reanalysis to construct Lagrangian moisture budget diagnostics and isolate dynamical, physical, and analysis tendency contributions.
- Quantify enhanced precipitation within high-CWV vapor lake air masses over the western equatorial Indian Ocean using satellite derived rainfall products (TRMM and GPM IMERG).
- Diagnose moisture transport pathways and maintenance mechanisms of vapor lakes through column-integrated and vertically resolved moisture budget analysis.
- Investigate the role of mesoscale convective organization and gross moist stability in sustaining sharp CWV gradients and persistent precipitation regimes.
- Extending the analysis to numerical modeling frameworks in CAM to evaluate representation of vapor lake dynamics.

Characterization of Bulk Entrainment Proxy Using CloudSat Observations *2020 – 2021*

Advisor: Dr. Suhas Ettammal, Department of Earth and Climate Science, IISER Pune, Maharashtra, India

- Quantified the bulk entrainment proxy of tropical anvil-forming convective clouds using CloudSat data.
- Examined diurnal and seasonal variations of bulk entrainment over tropical land and ocean.
- Implemented and configured the Quasi-equilibrium Tropical Circulation Model 1 (QTCM1), including compilation and execution of idealized simulations.

TEACHING

Teaching Assistant, MSC 204 P: Environmental Statistics *Fall 2024*

Instructor: Prof. Arthur Mariano, University of Miami, FL, USA

Teaching Assistant, MSC 204 P: Environmental Statistics *Spring 2024*

Instructor: Prof. William Drennan, University of Miami, FL, USA

CONFERENCE PRESENTATIONS

AMS 37th Conference on Hurricanes and Tropical Meteorology *Spring 2026*

Title: The Dynamics of Precipitating Water Vapor Lakes over the Western Equatorial Indian Ocean

Presentation, San Diego , CA

AMS 36th Conference on Hurricanes and Tropical Meteorology *Summer 2024*

Title: Understanding the Convection in Water Vapor "Lakes" in the Western Equatorial Indian Ocean

Presentation, Long Beach, CA

WORKSHOPS

Pythia Cookbook-2025 Hackathon Summer 2025

NCAR Mesa Lab, Boulder, CO, USA

5th Summer School on Theory, Mechanisms, and Hierarchical Modelling of Climate Dynamics: Convection and Clouds *Summer 2024*

Summer School, ICTP, Trieste, Italy

NCAR ASP Summer Colloquium: The Atmospheric Boundary Layer *Summer 2023*
Boulder, CO, USA

The 10th International Cloud Modeling Workshop *Summer 2021*
Indian Institute of Tropical Meteorology, Pune, India

PUBLICATIONS (IN PREP)

Samantaray, S., & Mapes, B. (2026). *Understanding long-lived precipitating vapor lakes over the tropical Indian Ocean.*

AWARDS

Xytel Best Master's thesis award in Earth and Climate Science 2022
IISER Pune, Maharashtra, India

Innovation in Science Pursuit for Inspired Research **(INSPIRE) Fellow in Science** 2016 to 2021
Department of Science and Technology (DST), Government of India

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RELEVANT COURSES

Advanced Weather Forecasting MPO 662 *Fall 2024*
Geophysical Fluid Dynamics II MPO 711 *Spring 2023*
General Circulation of the Atmosphere MPO 765 *Spring 2023*
Predictability MPO 713 *Spring 2023*
Geophysical Fluid Dynamics I MPO 661 *Fall 2022*
Introduction to Atmospheric Dynamics MPO 651 *Fall 2022*
Introduction to Atmospheric Physics MPO 652 *Fall 2022*

TECHNICAL SKILLS

Programming Language : Python, FORTRAN 90, MATLAB
Software : IDV, Minitab
Datasets : MERRA-2, ERA5, TRMM/GPM IMERG, CloudSat
Modeling : QTCM1; familiarity with CESM/CAM (setup, basic runs, diagnostics)