

Siddhant Kerhalkar

POSTDOCTORAL RESEARCHER · DEPARTMENT OF OCEANOGRAPHY

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Education

University of Massachusetts Dartmouth

North Dartmouth, USA

PHD IN MARINE AND ATMOSPHERIC SYSTEM MODELING AND ANALYSIS

2019 - 2025

• Advisor: Dr. Amit Tandon

GPA: **3.99/4.0**

Indian Institute of Technology Bhubaneswar

Bhubaneswar, India

B.TECH(HONS) IN MECHANICAL ENGINEERING

2015 - 2019

• Undergraduate thesis advisor: Dr. Sourav Sil and Dr. Yogesh Bhumkar

GPA: **9.15/10.0**

Professional Experience

- 2025-present **Postdoc.**, Department of Oceanography, University of Hawai'i Mānoa. **Advisor: Dr. Hyodae Seo**
- 2019-2025 **Research Assistant**, School for Marine Science and Technology (SMST), UMassD.
- 2018-2019 **Research Assistant**, Indian Institute of Technology Bhubaneswar.
- 2018 **Summer Fellow**, Indian National Centre for Ocean Information Services. **Advisor: Dr Francis P.A.**

Field Experience

- 2024 **R/V Thomas G Thompson, Bay of Bengal** (29 days)
Fast-CTD watch team and processing WaMoS data as a part of ASTraL (Office of Naval Research)
- 2023 **R/V Roger Revelle, Arabian Sea** (17 days)
uCTD watch team and processing ship MET, TSG and WaMoS data as a part of ASTraL (Office of Naval Research)
- 2020 **R/V Sally Ride, Eastern Tropical North Pacific** (21 days)
Collecting water samples, deploying CTD casts, process CTD data and shore support using remote sensing to study N-loss in ODZs (National Science Foundation)
- 2019 **R/V Lucky Lady, Buzzards Bay** (1 day)
Training cruise to collect water samples and deploy CTD casts (UMassD).
- R/V Sally Ride, Bay of Bengal** (28 days)
Fast-CTD Deployment, Watch and Recovery Team as a part of MISO-BoB (Office of Naval Research)

Publications

PEER-REVIEWED ARTICLES

- Kerhalkar, S.**, Kannad, A., Kinsella, A., Tandon, A., Sprintall, J., & Lee, C.M. (2025). Monsoon-Frontal Interactions Drive Cyclone Biparjoy's Wake Recovery in the Arabian Sea. *Geophysical Research Letters*.
doi: 10.1029/2024GL112413
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., MacKinnon, J. A., Schlosser, T., Johnson, L., Lucas, A.J., Hormann, V., & Centurioni, L.(in review) Modulation of Diurnal SST and Diurnal Warm Layer Variability by Salinity-Driven Stratification in the Bay of Bengal. *Journal of Physical Oceanography*.
- Kerhalkar, S.**, Tandon, A., & MacKinnon, J. A. (in prep). Impacts of Salinity Stratification on sub-seasonal SST warming in the Northern Indian Ocean. *Journal of Geophysical Research: Oceans*.
- Pham, H.T., Sarkar, S., **Kerhalkar, S.**, & Tandon, A. (in prep). How do the interactions between winds, heat fluxes and frontal currents / jets affect the vertical and cross-front thermal transport in the Dense Water Filament? *Journal of Physical Oceanography*.
- Sarkar, D., **Kerhalkar, S.**, & Tandon, A.(in prep). Inaccuracies in reanalysis products: A case study of the Arabian Sea from 2017 to 2018. *Journal of Climate*.
- Kerhalkar, S.**, Tandon, A., Hormann, V., & Centurioni, L. (2022). Using drifter observations to unearth the mysteries of Monsoons in the Bay of Bengal. In *OCEANS 2022-Chennai* (pp. 1-7). IEEE.
doi: 10.1109/OCEANSChennai45887.2022.9775481

GRAY LITERATURE

Kerhalkar, S., Salinity Stratification and Lateral Variability in the Northern Indian Ocean: From Calm Diurnal Cycles to Cyclone-Induced Recovery, PhD Thesis, 2025

Kerhalkar, S., Applications of Computational Aero-Acoustics in understanding acoustic properties of oceans. Undergraduate Thesis, 2019

Kerhalkar, S., Francis, P.A., Studying the Vertical Ocean Mixing in Bay of Bengal and Arabian Sea using the KPP Boundary Layer scheme Summer Fellowship Report, 2018

Awards, Fellowships, & Grants

2023 **Travel Support Award**, CLIVAR

2022 **Travel Support Award**, ICERM
Travel Support Award, Gordon Research Student Meeting

2019 **Distinguished Doctoral Fellowship**, Provost's office, UMass Dartmouth (Support for 4 years)

2019 **Multiple Travel Grants**, UMassD- Graduate Students Office, Graduate Student Senate, IMS program,
to SMAST, MechE (capped at \$ 2250 a year)
2024

2018 **Summer Research Fellowship (2 month fellowship)**, Indian Academy of Sciences

Presentations

** presenting author; + mentored students*

INVITED TALKS

March 25 2025. *Physics of Hurricanes*. Second Half Lifelong Learning Institute , New Bedford

February 26 2025. *Impacts of Salinity Stratification on SST in the Northern Indian Ocean Warm Pool*. DEOS Departmental Seminar, SMAST, UMassD

December 02 2024. *How does the salinity stratification impact SST warming over short/long timescales?*. EKAMSAT Seminar Series

August 20 2024. *Lateral Gradients in Salinity Stratification driving differences in Diurnal Warm Layer evolution in the Bay of Bengal*. PO Departmental Seminar, Woods Hole Oceanographic Institution

July 10 2024. *Diurnal Warm Layers and its lateral gradients in the Bay of Bengal*. SEOCS Departmental Seminar, IIT Bhubaneswar

April 01 2024. *Air-sea flux parameterization development using EKAMSAT and other field campaign observations*. EKAMSAT Seminar Series (co-presented with Dr. Hyodae Seo)

March 27 2024. *Physics of Hurricane wake evolution: A case study in the Arabian Sea*. Plenary talk at 2024 IMS Symposium, SMAST, UMassD

January 31 2024. *Physics of Diurnal Warm Layers and its lateral gradients in the Bay of Bengal*. DEOS Departmental Seminar, SMAST, UMassD

July 11 2023. *Lateral Gradients in Diurnal Warm Layers in the Bay of Bengal*. Seminar at Indian Institute of Tropical Meteorology, Pune, India

November 04 2021. *Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019*. Seminar at Monsoon Meeting, Woods Hole Oceanographic Institution

October 06 2021. *Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019*. Seminar at Geophysical Flows Lab, Indian Institute of Technology, Madras, India

August 23 2021. *On the Diurnal Warm Layers in the Bay of Bengal*. PhD proposal defense, SMAST, UMassD

February 25 2021. *Monsoons in the Bay of Bengal and Ocean Spring Blooms*. Mechanical Engineering Departmental Seminar at UMassD (co-presented with Dr. Iury Simoes-Sousa)

CONFERENCE PRESENTATIONS

- Kerhalkar, S.**, Tandon, A., MacKinnon, J. A., Seo, H.: Impacts of Salinity Stratification and wave-based formulation on SST within the Indian Ocean mini-warm pool, EKAMSAT Science Meeting, Herndon, September 10-11 2025
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., MacKinnon, J., Schlosser, T., Johnson, L., Lucas, A.J.: Impacts of Salinity Stratification on SST in the Northern Indian Ocean Warm Pool, EKAMSAT Science Meeting, Boulder, March 6-7 2025
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., MacKinnon, J., Schlosser, T., Johnson, L., Lucas, A.J.: How does the salinity stratification impact SST warming over short/long timescales? EKAMSAT Science Meeting, Seattle, September 12-13 2024
- Kerhalkar, S.**, Kannad, A., Kinsella, A., Tandon, A., Sprintall, J., Lee, C.: Observations of the cyclone Biparjoy's cold wake decay. Ocean Sciences Meeting, New Orleans, February 18-23 2024
- Tandon, A. *, **Kerhalkar, S.**, Kannad, A., Kinsella, A., Sprintall, J., Lee, C.: Observations of the cyclone Biparjoy's cold wake decay. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Seo, H. *, **Kerhalkar, S.**, Sauvage, C., Tandon, A.: Improving wave-mediated air-sea flux parameterizations in mixed seas: Observational and modeling for improved monsoon predictions. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Bonfils, A., Ramana, P., **Kerhalkar, S.** *, Athulya, K., Abhilash, K.: Near-inertial Oscillations in the North Indian Ocean: A case study. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Kerhalkar, S.**, Tandon, A., Schlosser, T., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L.: Observing and Modeling the variability of DWLs during the summer Monsoon in the Northern Indian Ocean. EGU Meeting, Vienna, April 23-28 2023 (virtual)
- Monroe, N. *, **Kerhalkar, S.**, Tandon, A.: Biases in the Air-Sea Interaction during the Year 2017-18 in the Arabian Sea. MassURC, April 28 2023 (virtual)
- Balabanova, V. *, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Validating Geostrophic Balances in the North Atlantic Ocean. MassURC, April 28 2023 (virtual)
- Joseph, E. *, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Studying the Ocean Surface Variables using Satellite imagery and Numerical Modeling. MassURC, April 21 2022 (virtual)
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. Ocean Sciences Meeting, February 27- March 04 2022(virtual)
- Kerhalkar, S.**, Tandon, A., Hormann, V., Centurioni, L.: Using drifter observations to unearth the mysteries of Monsoons in the Bay of Bengal. IEEE-MTS OCEANS 2022-Chennai, February 21-24 2022
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. MISO-BoB All-PI meeting, October 02 2021(virtual)
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. MISO-BoB All-PI meeting, October 02 2021(virtual)
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L.: Observations of Diurnal Warm Layers Mixing in the Central Bay of Bengal-2019 IOP. MISO-BoB All-PI meeting, December 01 2020(virtual)

POSTERS

- Kerhalkar, S.**, Kannad, A., Kinsella, A., Tandon, A., Sprintall, J., & Lee, C.M. (2025). Monsoon-Frontal Interactions Drive Cyclone Biparjoy's Wake Recovery in the Arabian Sea. IMS Symposium, SMAST, UMassD, March 26 2025
- Sarkar, D. *, **Kerhalkar, S.**, Tandon, A., Joseph, J.: Inaccuracies in reanalysis products: A case study of the Arabian Sea from 2017 to 2018. Sigma-Xi Research Exhibit, UMassD, April 17 2024
- Sarkar, D. *, **Kerhalkar, S.**, Tandon, A., Joseph, J.: Inaccuracies in reanalysis products: A case study of the Arabian Sea from 2017 to 2018. IMS Symposium, SMAST, UMassD, March 27 2024
- Tandon, A. *, **Kerhalkar, S.**, Sarkar, D., Joseph, J.: On the Air-sea reanalyses flux biases in the Arabian Sea: A case study from 2017-2018. Ocean Sciences Meeting, New Orleans, February 18-23 2024
- Sarkar, D. *, **Kerhalkar, S.**, Tandon, A., Joseph, J.: On the Air-sea reanalyses flux biases in the Arabian Sea: A case study from 2017-2018. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Schlosser, T., Johnson, L., Lucas, A., Hormann, V., Centurioni, L., MacKinnon, J.: Lateral Gradients in Diurnal Warm Layers in the Bay of Bengal. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Monroe, N. *, **Kerhalkar, S.**, Tandon, A.: Biases in the Air-Sea Interaction during the Year 2017-18 in the Arabian Sea. Sigma Xi Research Exhibit, UMassD, April 21 2023

Balabanova, V.⁺⁺, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Validating Geostrophic Balances in the North Atlantic Ocean. Sigma Xi Research Exhibit, UMassD, April 21 2023

Kerhalkar, S., Tandon, A., Schlosser, T., Farrar, J. T., Johnson, L., Lucas, A., Hormann, V., Centurioni, L., MacKinnon, J.: Observing and Modeling the variability of DWLs during the Summer IMS Symposium, SMAST, UMassD, March 22 2023

Kerhalkar, S., Tandon, A., Schlosser, T., Farrar, J. T., Johnson, L., Lucas, A., Hormann, V., Centurioni, L., MacKinnon, J.: Observing and Modeling the variability of DWLs during the Summer Monsoon in the Northern Indian Ocean. CLIVAR Mesoscale and Frontal Scale Air-Sea Interaction Workshop, Boulder, March 6-8 2023

Kerhalkar, S., Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. FILACHANGE-SWOT workshop, Providence, August 27-31 2022

Kerhalkar, S., Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. Gordon Research Meeting on Ocean Mixing, June 05-10 2022

Joseph, E.⁺⁺, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Studying the Ocean Surface Variables using Satellite imagery and Numerical Modeling. Sigma Xi Research Exhibit, UMassD, April 21 2022

Kerhalkar, S., Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. Sigma Xi Research Exhibit, UMassD, April 21 2022

Kerhalkar, S., Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. IMS Symposium, SMAST, UMassD, March 23 2022

Kerhalkar, S., Tandon, A., Farrar, J. T., Hormann, V., Centurioni, L., Lucas, A.: High Resolution Observations of Diurnal Warm Layers in the Bay of Bengal during the Indian Summer Monsoon 2019. IMS Symposium, SMAST, UMassD, March 24-25 2021

Kerhalkar, S., Tandon, A., Shroyer, E., Centurioni, L., Nash, J., MacKinnon, J., Farrar, J. T., Johnson, L.: On the Sea Surface Temperature variability and mesoscale dispersion in the Bay of Bengal during 2015 and 2019 monsoon as tracked by drifters. Ocean Sciences Meeting, San Diego, February 16-21 2020

Kerhalkar, S., Francis, P.A.: Studying the Vertical Ocean Mixing in Bay of Bengal and Arabian Sea using the KPP Boundary Layer scheme. National Oceanography Workshop, Hyderabad, India, November 14-16 2018

Mentoring

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| 2023-2024 | Debarshi Sarkar , 1st Year PhD Student, Engineering and Applied Sciences Working on comparing observations of observed and derived air-sea interaction parameters at OMNI moorings in the Arabian Sea with popular reanalysis products to report biases, which are detrimental for Indian Monsoons. | UMassD |
| 2023 | Viktoriya Balabanova , UMassD-WHOI Blue Economy Internship Focused on validating geostrophic balance by comparing the observations from a mooring deployed in North Atlantic to the Satellite altimetry | |
| 2022-2023 | Nicholas Monroe , APEX Thesis (Honors College), UMassD Focused on intercomparing parameters of air-sea interaction from reanalysis products to observations from one mooring in the Arabian Sea, with a goal to quantify the biases | |
| 2021-2022 | Ersen's Joseph , REU Student and UMassD-WHOI Blue Economy Internship His project involved analyzing RAMA mooring data in the Bay of Bengal, developing a numerical particle tracking model and comparing with observed particle motion in open ocean as well as using powerful computation resources to analyze remote sensing datasets in order to uncover the seasonality in the Bay of Bengal | |

Outreach & Professional Development

DEVELOPMENT

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| 2024-2025 | Life Skills for Young Scientists (LiSYS) by Dr. Jonathan Lilly , Participant | <i>Virtual</i> |
| 2024 | Ocean/Atmosphere Time Series Analysis by Dr. Jonathan Lilly , Participant | <i>Virtual</i> |
| | Geophysical Flows: From the Field to the Lab- Hands on Workshop , Participant | <i>IIT Madras</i> |
| 2023 | ONR Code 322 Graduate Student and Postdoc Workshop , Participant | <i>Arlington, VA</i> |
| 2022 | ICERM: Prediction and Variability of Air-Sea Interactions , Participant | <i>Brown Univ.</i> |
| | NASA Openscapes , Participant | <i>Virtual</i> |
| 2021 | ICERM: Prediction and Variability of Air-Sea Interactions , Participant | <i>Virtual</i> |

SKILLS

- Application Software: MATLAB, NOAA Ferret, GRADS, SolidWorks, Ansys (Beginner), Inkscape, SeaBird Processing
- Programming Languages: Python, Fortran
- Languages: English (fluent), Hindi (Native), Marathi (Native)

PEER REVIEWER

- Geophysical Research Letters
- Journal of Physical Oceanography
- Journal of Geophysical Research: Oceans
- AGU Earth and Space Science
- T & F Marine Geodesy
- Oceanological & Hydrobiological Studies
- RMetS Weather

POSITIONS OF RESPONSIBILITY

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| 2024-2025 | EKAMSAT Waves Working group , Co-ordinator |
| | SMAST Curriculum committee , Student Representative |
| 2020-2022 | SMAST Graduate Student Association , Student Representative |
| 2021 | Indian Students Association (ISA) , Graduate Student Advisor |
| | Graduate Student Senate , Webmaster |
| 2019-2025 | Tandon Laboratory, UMassD , Webmaster |

SERVICE AND OUTREACH

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| 2025 | Second Half Lifelong Learning Institute , Guest Lecturer | <i>New Bedford, MA</i> |
| 2024 | Party for the Planet , Exhibitor | <i>New Bedford, MA</i> |
| | Junior Science and Humanities Symposium Regionals , Judge | <i>RWU, Bristol</i> |
| 2022 | Weekly Summer Tours for Tabor Academy High School Students , Co-ordinator | <i>SMAST, UMassD</i> |
| | IMS Symposium , Co-organizer | <i>SMAST, UMassD</i> |
| 2021 | Graduate School Fair , Exhibitor | <i>UMass Dartmouth</i> |
| | ISA Pre-arrival orientation , Co-organizer | <i>Virtual</i> |
| | IMS Symposium , Co-organizer | <i>Virtual</i> |

MEMBERSHIPS

- American Geophysical Union
- The Oceanography Society
- Society for Industrial and Applied Mathematics
- European Geosciences Union
- Marine Technology Society
- UMassD-SMAST Graduate Student Association
- UMassD Indian Student Association
- UMassD Outdoor Club