

DEEPAK A. CHERIAN

- Education**
- 2016: Ph.D., MIT-WHOI Joint Program in Oceanography, Physical Oceanography
 - 2010: M.Tech. & B.Tech. (Hons.), Ocean Engineering & Naval Architecture, Indian Institute of Technology, Kharagpur.
- Positions**
- 2020 Jan – present: Project Scientist I, National Center for Atmospheric Research
 - 2019 Mar – 2020 Jan: Postdoctoral Fellow, National Center for Atmospheric Research
 - 2017 Jan – 2019 Mar: Research Associate (Post-Doc), Oregon State University
 - 2016 Sep – 2017 Jan: Postdoctoral Investigator, Woods Hole Oceanographic Institution
 - 2010–2016: Graduate research assistant, Massachusetts Institute of Technology & Woods Hole Oceanographic Institution
- Articles**
- Moum, J.N., et. al. (2022) “Deep Cycle Turbulence in Atlantic and Pacific Cold Tongues”. *Geophysical Research Letters* (49).
 - Whitt, D.B., **Cherian, D.A.** et. al. (2022) “Simulation and scaling of the turbulent vertical heat transport and deep-cycle turbulence across the equatorial Pacific cold tongue”. *Journal of Physical Oceanography*.
 - Philipps, H.E., et. al. (2021) “Progress in understanding of Indian Ocean circulation, variability, air-sea exchange and impacts on biogeochemistry”. *Ocean Science Discussions* (17) : 1677–1751.
 - Shroyer, E.L., et. al. (2021) “Bay of Bengal Intraseasonal Oscillations and the 2018 Monsoon Onset”. *Bull. Amer. Meteor. Soc.* 102 (10): E1936-E1951
 - Cherian, D.A.**, Whitt D.B., Holmes, R.M., Lien, R.-C., Bachman, S.D., Large, W.L. (2021). “Off-equatorial deep cycle turbulence forced by Tropical Instability Waves in the equatorial Pacific”. *Journal of Physical Oceanography*. 51 (5): 1575–1593.
 - Rypina, I.I., Pratt, L.J., Entner, S., Anderson, A., **Cherian, D.A.** (2020). “The Influence of an Eddy in the Success Rates and Distributions of Passively Advected or Actively Swimming Biological Organisms Crossing the Continental Slope”. *Journal of Physical Oceanography* 50 (7): 1839–1852.
 - Cherian, D.A.**, Shroyer, E.L., Wijesekera, H.W. and Moum, J.N. (2020). “The seasonal cycle of upper-ocean mixing at 8°N in the Bay of Bengal”. *Journal of Physical Oceanography* 50: 323–342

Cherian, D.A. and Brink, K.H. (2018). “Shelf flows forced by deep-ocean anticyclonic eddies at the shelfbreak”. *Journal of Physical Oceanography*. 48 (5): 1117-1138

Cherian, D.A. and Brink, K.H. (2016) “Offshore Transport of Shelf Water by Deep-Ocean Eddies.”, *Journal of Physical Oceanography* 46 (12): 3599–3621

Brink, K.H. and **Cherian, D.A.** (2013) “Instability of an idealized tidal mixing front: Symmetric instabilities and frictional effects.”
Journal of Marine Research 71 (6): 425–450.

Haine, T.W.N. and **Cherian, D.A.** (2013) “Analogies of Ocean/Atmosphere Rotating Fluid Dynamics with Gyroscopes: Teaching Opportunities.”
Bull. Amer. Meteor. Soc. 94: 673–684.

Funding

Co-I 2023-2028 ONR Arabian Sea Transition Layer Departmental Research Initiative.
“High resolution coupled modeling and data assimilation for improved understanding of transition layer processes in the Arabian Sea Warm Pool”

Co-I 2022-2025 NOAA Climate Variability and Predictability.
“Developing a framework for a field campaign in the cold tongue: Analysis of Pacific Upwelling and Mixing Physics from models and observations.”

Co-PI 2022-2025 NASA Open Source Tools, Frameworks, and Libraries.
“Enhancing analysis of NASA remote sensing datasets with Xarray”

Co-I 2020-2021 Chan Zuckerberg Initiative Essential Open Source Software.
“Xarray: Multidimensional Labeled Arrays and Datasets in Python”

lead-PI, 2019-2022 NASA Physical Oceanography.
“Relating SSHA-derived Eddy Diffusivity to In-situ Estimates from Microstructure and ECCO.”

Invited Talks

“*Seasonal cycle of mixing in the Bay of Bengal*”

2022: (talk) Prediction and Variability of Air-Sea Interactions: the South Asian Monsoon, ICERM Workshop.

“*Open-Sesame: open your science with Pangeo*”

2022: (talk) Ocean Sciences Meeting.

“*Off-equatorial deep-cycle turbulence forced by Tropical Instability Waves in the equatorial Pacific*”

2020: Department of Marine & Coastal Sciences Seminar Series, Rutgers University.
Physical Oceanography Seminar, University of Washington

Talks &
Posters

“When a deep-ocean eddy meets shelf-slope topography.”

2019 : Gordon Research Conference, Coastal Ocean Dynamics.

“Looking for mesoscale stirring in microstructure.” — presented at

2022: Gordon Research Conference, Ocean Mixing, 2022
(talk) Eddy Mixing Climate Processes Team Meeting
Ocean Sciences Meeting, 2022

“flox: fast and furious GroupBy reductions with Dask at Pangeo scale.” — presented at

2021: Pangeo Showcase
Dask Distributed Summit

“Off-equatorial deep cycle turbulence forced by Tropical Instability Waves in the equatorial Pacific” — presented at

2021: Climate & Global Dynamics Laboratory Seminar, NCAR.
2020 : (talk) AGU General Meeting, 2020
University of British Columbia, Physical Oceanography Seminar
(talk) Ocean Sciences Meeting, 2020 - San Diego

“The seasonal cycle of upper-ocean mixing in the Bay of Bengal” — presented at

2019 : Massachusetts Institute of Technology, Sack Lunch Seminar
Woods Hole Oceanographic Institution, Physical Oceanography Seminar
National Center for Atmospheric Research, CGD seminar
Oregon State University, CEOAS seminar
2018 : (poster) Gordon Research Conference, Ocean Mixing
(talk) Ocean Sciences Meeting, 2018 - Portland

“Shelf flows forced by mesoscale eddies at the shelfbreak” — presented at

2017 : (poster) Gordon Research Conference - Coastal Ocean Dynamics

“Offshore export of shelf water by deep-ocean eddies” — presented at

2017 : National Taiwan University
Oregon State University, CEOAS seminar
2016 : Indian Institute of Science, College of Ocean and Atmospheric Sciences
(talk) Ocean Sciences Meeting, 2016 - New Orleans

“Arresting an eddy’s cross-isobath translation” — presented at

2016 : Oregon State University, CEOAS seminar
Massachusetts Institute of Technology, Sack Lunch Seminar
2015 : (talk, poster) Gordon Research Conference - Coastal Ocean Modeling

- Software** Extensive experience with parallel analysis of large datasets using scientific Python packages on HPC and cloud computing systems e.g. Dask, NumPy, Pandas, xarray; extensive experience with MATLAB
- Service** Co-lead, NCAR Earth System Data Science Initiative, 2020–present
 Subject Matter Expert, NASA Earth System Observatory Independent Review Board; 2022.
 External reviewer for the NSF Physical Oceanography panel; 2021, 2022.
 Core developer for open source Python packages in the Pangeo ecosystem: xarray, xgcm, cf_xarray
 Published articles describing scalable data analytics techniques on NCAR’s Earth System Data Science blog (link).
 Assistance with parallel scaling of analysis workflows on various public forums; e.g. Xarray Github, Pangeo Discourse forum, NCAR internal channels.
 Reviewer for Ocean Science, Geophysical Research Letters, Journal of Geophysical Research - Oceans, Journal of Marine Research, and Journal of Physical Oceanography.
- Teaching, Mentoring, Outreach** 2021, 2022: Project Mentor, NCAR CISL Summer Internships in Parallel Computer Science (SIParCS).
 2022: Mentor, AGU Geosciences Education & Mentorship Support (GEMS) program
 2020: Coiled Science Thursday Livestream Series: Demo on “Scalable computing in oceanography.” (Youtube).
 2020 SciPy Conference: Tutorial on python package xarray
 2020 Ocean Hack Week: Invited tutorial on python package xarray for analysis of geoscience datasets.
 2019 Project Mentor, Monsoon Air-Sea Interactions Winter School. International Center for Theoretical Studies, Bangalore, India
 2017 Winter Term: Guest Lecture for “Geophysical Waves” , (graduate level course), Oregon State University

- Additional Training**
- 2020 Diversity leadership training summit organised by UCAR Human Resources and the Office for Diversity, Equity and Inclusion.
 - 2014 Coastal and Estuarine Field Methods Summer School, Woods Hole Oceanographic Institution
 - 2013 Teaching Certificate Program, Massachusetts Institute of Technology
 - 2012 Estuarine and Coastal Fluid Dynamics Summer School, University of Washington Friday Harbor Laboratories
- Fieldwork**
- 2018 Sep: *R/V Thomas G. Thompson*, Western Pacific. PI: Jim Moum (OSU)
 - 2017 Feb: *R/V Roger Revelle*, South China Sea. PI: Lou St-Laurent (WHOI)
 - 2014 July: *R/V Tioga*, off Martha's Vineyard. (student-run cruise for summer school)
PI: Deepak Cherian, Jonathan Fincke, Cara Manning (WHOI).
 - 2013 Nov: *R/V Roger Revelle*, Bay of Bengal. PI: Emily Shroyer (OSU)
 - 2011 July: *SSV Corwith Cramer*, Middle Atlantic Bight. PI: Donglai Gong (WHOI)