Climate & Global Dynamics Laboratory
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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

Abernathey, R., Busecke, J., Banihirwe, A., Zhang, C., Smith, T.A., Cherian, D.A., Ponte, A. "Xgcm: A Python Package for Analyzing Data from General Circulation Models". (submitted). Journal of Open Source Software

Cherian, D.A., Whitt D.B., Holmes, R.M., Lien, R.-C., Bachman, S.D., Large, W.L. (submitted). "Off-equatorial deep cycle turbulence forced by Tropical Instability Waves in the equatorial Pacific". Journal of Physical Oceanography.

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

2020-2021 Chan Zuckerberg Initiative Essential Open Source Software, Co-I
$150k to NumFOCUS
"Xarray: Multidimensional Labeled Arrays and Datasets in Python"

2019-2022 NASA Physical Oceanography, lead-PI, $483k to NCAR
Co-Is: Emily Shroyer (OSU), Jonathan Nash (OSU)
"Relating SSHA-derived Eddy Diffusivity to In-situ Estimates from Microstructure and ECCO."

Invited Talks

"*When a deep-ocean eddy meets shelf-slope topography.*"
2019 : Gordon Research Conference, Coastal Ocean Dynamics.

Talks & Posters

"*An off-equatorial deep cycle of turbulence forced by Tropical Instability Waves in the equatorial Pacific*" — presented at
2020 : University of British Columbia, Physical Oceanography Seminar
(talk) AGU 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) AGU 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) AGU Ocean Sciences Meeting, 2016 - New Orleans

"*Arresting an eddy's cross-isobath translation*" — presented at
2016 : Oregon State University, CEOAS seminar
Massachusetts Insitute 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

Reviewer for Ocean Science, Geophysical Research Letters, Journal of Geophysical Research - Oceans, Journal of Marine Research and Journal of Physical Oceanography.

Core developer of open source Python package `xarray`, widely used for data analysis in geosciences.

Assistance with parallel scaling of analysis workflows on various public forums; e.g. Xarray Github, Pangeo Discourse forum, ClimateGrad early career Slack group.

Teaching & Outreach

2020: Coiled Science Thursday Livestream Series: Demo on "Scalable computing in oceanography." (Youtube).

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

2014 Fall semester: Teaching Assistant, "Observational Physical Oceanography" (graduate level course), Massachusetts Institute of Technology.

2013: Conducted rotating tank lab demonstrations for broad audience (public, scientists, students — graduate and K-12) at WHOI GFD Open Days

2013: Lecturer, Four lectures on "Physical Oceanography", WHOI Winter Semester for Undergraduates

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)