Manish S. Devana

Oceanography | Data Analysis | Climate Research

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Objectives

Seeking opportunities for marine or climate related data analysis , applications of machine learning to climate and environment issues, and green technology development in fast paced and innovative teams. Skilled in problem solving, geospatial and time series data analysis across multiple languages, experienced in field work at sea, collaborative analysis, communication of technical and research material to a range of audiences.

Current Research Interests

I currently study deep ocean circulation in the North Atlantic Program as a PhD student under the Overturning in the Subpolar North Atlantic Program (OSNAP). My research examines abyssal flows across a wide range of physical and temporal scales to understand how flow varies in strength, position, and its hydrographic properties.

Research Experience

[1] **Overturning in the Subpolar North Atlantic Program (OSNAP)** *Graduate Research Assistant, University of Miami* **2018-Present**

- Investigated mid-depth and deep ocean flows across a range of physical and temporal scales in an effort to understand various components of the flow variability and impacts on larger Atlantic Meridional Overturning Circulation
- Geospatial data analysis with numerous types of datasets including: high resolution time series, unstructured spatial shipboard and ARGO observations, remote sensing observations (ocean altimetry and sea surface temperature), high resolution numerical model “big data”, ocean and atmosphere reanalysis products.
- Implemented numerical simulations to supplement observational campaigns (fluid dynamics simulations and statistical models)
- Assisted in constructing, deploying, and recovering mooring arrays with various instruments during multiple sea campaigns. Tasks involved manual construction of instrument components, calibrating instruments, data quality control and calibration post recovery
- Collaborative work involving partners at institutions in numerous countries

[2] **Internal Wave Dynamics** *Master’s Student, University of Southampton* **2015-2018**

- Examined high resolution hydrographic observations from the Southern Ocean to quantify internal wave activity over topographic features using spectral methods and parameterization techniques.
- Simulated internal wave evolution by constructing a ray tracing model for 3-D evolving fields surrounding the observational site.

Technical Skills

[1] Python (Strong)

- Experience using geospatial datasets with core earth science python packages (xarray,cartopy, dash, GMT, netcdf, numpy, scipy).
- Developed python programs for oceanographic field work (CTD and mooring data processing, mooring trilateration, instrument calibrations).
- Extensive experience with data visualization techniques including: matplotlib static and animated figures, interactive visualizations, geospatial visualizations, real-time data visuals, and “big-data” visualization techniques.
- Extensive experience with time series analysis and unstructured observational data

- Open science oriented methods including working and collaborating in jupyter notebooks and binders for data analysis.
- Familiar with developing machine learning models for research and data analysis using Tensorflow, pyTorch, and Keras.
- Familiar with high performance computing operations including modifying code for GPU operations and parallelization of algorithms.

[2] Julia (Proficient)

- Experience with numerical fluid dynamics simulations, geospatial and time series data analysis

[3] Matlab (Strong)

[4] Javascript (Proficient)

[5] Proficient in Linux operating systems (experience with CentOs, Debian, and Ubuntu)

[6] HTML & CSS (Proficient) - Experience responsive designing web pages and markdown documentation

Fieldwork Experience

[1] RAPID-MOCHA Mooring Recovery and Hydrographic Survey Cruise *2018 November*

- Assisted with mooring deployments and recovery during 22 day cruise on the R/V Atlantic Explorer

[2] OSNAP Mooring Recovery and Hydrographic Survey Cruise *2019 September*

- Assisted with mooring build, deployments, and recovery, CTD operations, salinity/temperature/velocity instrument calibrations, and realtime data analysis during 34 day cruise on the R/V Armstrong

[3] RAPID-MOCHA Mooring Recovery and Hydrographic Survey Cruise *2021 September*

- Assisted with mooring build, deployments, and recovery, CTD operations, salinity/temperature/velocity instrument calibrations, and realtime data analysis during 24 day cruise on the R/V Endeavor

[4] OSNAP Mooring Recovery and Hydrographic Survey Cruise *2022 August (planned)*

Publications

[1] M. Devana, W.E. Johns (2021): Rapid Freshening of Iceland Scotland Overflow Water Driven by Entrainment of a Major Upper Ocean Salinity Anomaly, *Geophysical Research Letters*

[2] W.E.Johns, M.Devana, A.Houk, S.Zou (2021): Moored Observations of the Iceland-Scotland Overflow Plume Along the Eastern Flank of the Reykjanes Ridge, *Journal of Geophysical Research: Oceans*

Seminars and Conference Presentations

[1] Geophysical Fluid Dynamics Summer School Student Seminar- *2019*

[2] American Geophysical Union Fall Meeting 2019: **Rapid Freshening of the Iceland Scotland Overflow Driven by Entrainment** - *2019*

[3] Ocean Sciences Fall Meeting 2020: **Rapid Freshening of the Iceland Scotland Overflow Driven By Entrainment**- *2019*

[4] Ocean Sciences Fall Meeting 2022: **Variability of the Iceland Scotland Overflow** - *2022*

[5] U.S. Atlantic Meridional Overturning Circulation Science Team Meeting: **Rapid Freshening of the Iceland Scotland Overflow Driven By Entrainment** - *2022*

[6] American Meteorological Society Atmospheric and Oceanic Fluid Dynamics 2022: **Boundary Layer Dynamics in Bottom Intensified Flow along the Reykjanes Ridge** - *2022*

Education

[1] Rosenstiel School of Marine and Atmospheric Science, University of Miami: *Meteorology and Physical Oceanography - PhD* **2018-Present**

[2] 2015-2018 University of Southamption, UK, *Physical Oceanography* ***First Class Honours*** *- MSCi (integrated BSC & MSC)* **2015-2018**

[3] New York University: *Biochemistry* **2013-2015**

Professional Development

[1] Graduate Undergraduate Mentoring (GUM) *Co-Founder and Mentor* **2019-Present**

- Co-founded mentoring program for earth science graduate students to mentor undergraduate students with the aim of enhancing the experience and retention of under-represented groups of students in earth science research

[1] COMPASS Student Seminar Series Speaker **2019, 2020, 2021**

[2] University of Miami Teaching Assistant:*Intro to Marine Science Lab* **Fall 2019**

[3] University of Miami Teaching Assistant:*Python Programming for Marine Science* **Fall 2021**

Awards and Honors

[1] Top of Class University of Southampton Oceanography **2018**

[2] 2019 Outstanding Student Presentation Award - AGU Fall Meeting **2019**

[3] COMPASS Student Seminar Series Best Graphics **2019-20**

[4] COMPASS Student Seminar Series 3rd Place Overall **2021-22**

Teaching Experience

[1] University of Miami Teaching Assistant **Introduction to Marine Science Laboratory** **Fall 2019**

[2] University of Miami Teaching Assistant **Python Programming for Marine Science** **Fall 2021**

[3] University of Southampton Student Teaching Assistant **Marine Geochemistry** **Fall 2017**

Other Work Experience

[1] Wetlab Bar (*Bartender*) **2019-Present**

[2] University of Southampton Student Union (*Event Staff and Bartender*) **2016-2018**

[3] Cal Adventures Summer Camp *Windsurfing/Sailing Instructor and Boating Programs Manager* **2014-2017**

References

- Wiliam E. Johns: Professor, Meteorology and Physical Oceanography, University of Miami, RSMAS
- Mohamed Iskandarani: Professor, Meteorology and Physical Oceanography, University of Miami, RSMAS