

Abhijith Raj

Project Scientist I Oceanographer

Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, India
abhijithraj@gmail.com | (+91) 9995830011

RESEARCH INTERESTS

Ocean Observations, Air-sea interactions, eddy covariance flux technique & instrumentation, Momentum flux, Ocean surface waves, Air-sea flux parameterization, parameterization and optimization of WAVEWATCH III model for regional scales, wind-wave interaction.

SKILLS

Instruments

Eddy Covariance System (Sonic Anemometer, IRGA, IMU), CTD/uCTD, VMP, LADCP, Radiosonde

Programming

MATLAB, Python, Fortran, C

Tools & Platforms

WAVEWATCH III, Ferret, Shell scripting, Linux/Unix, Windows

POSITIONS

Project Scientist I, Ocean Observation Networks (OON), INCOIS

- Contributing to design, planning, deployment and data collection using advanced Eddy-Covariance Flux Systems on research vessels (ORV Sagar Nidhi, CRV Sagar Manjusha), enhancing air-sea interaction studies.
- Developed MATLAB-based scripts for data processing and quality control of INCOIS-FRS data.
- Collaborating with interdisciplinary teams to integrate ocean observation data into wave models, contributing to improved forecasting capabilities.

Sep 2024-
Present

Senior Research Fellow, Ocean Observation Networks (OON), INCOIS

- Data processing, analysis, and manuscript preparation for 2 peer-reviewed publications, utilizing MATLAB for spectral analysis and interpretation of complex air-sea interaction datasets.
- Managed the maintenance of oceanographic instruments, INCOIS-FRS, ensuring data accuracy for research campaigns.
- Contributed significantly to the parameterization and optimization of the WAVEWATCH III model for regional scales, improving wave forecasting accuracy for specific Indian Ocean wave conditions.

Sep 2021-
Sep 2024

Junior Research Fellow, Ocean Observation Networks (OON), INCOIS

- Participated in 2 scientific cruises, assisting in the collection and preliminary analysis of oceanographic data using various instrumentation
- Collaborated in setup and validation of wind input parameterizations in WAVEWATCH III model

Sep 2019-
Sep 2021

EDUCATION

Ph.D. Oceanography

KUFOS-INCOIS Joint Research Centre, Hyderabad, India

"Micrometeorological aspects of air-sea flux transfer in the Indian Ocean"

Advisor: Dr. B. Praveen Kumar (Scientist-E, INCOIS)

2020-present

M.Sc. Oceanography

Cochin University of Science and Technology, Kochi, India

Advisor: Dr. Girishkumar M.S (Scientist-F, INCOIS)

2017-2019

B.Sc. Physics

University of Calicut, Calicut, India

2013-2016

Diploma in Computer Applications

Centre for Development of Imaging Technology, Kerala, India

2013

HONORS & AWARDS

Fellowships & Scholarships

POGO-SCOR Fellowship at WHOI (Woods Hole Oceanographic Institution)

2025

Jerome M. Paros Scholarship in Geophysical Instrumentation, American Geophysical Union

2023

MRFP Research Fellowship, Ministry of Earth Science, India

2019-2024

ASPIRE Scholarship, Directorate of Collegiate Education, Govt. of Kerala

2018-2019

Recognitions

Best Poster award, 8th National Conference of the Ocean Society of India (OSICON- 23)

2023

3rd rank in the M.Sc. Oceanography program, Cochin University of Science and Technology

2019

17th rank in National Eligibility Test (NET) for Lectureship (LS) and Research in Earth Sciences, Council of Scientific and Industrial Research, Govt. of India.

2018

PUBLICATIONS

[*] **Raj, A.**; B. Praveen Kumar; Venkata Jampana; P.G Remya; Hyodae Seo; N Sureshkumar; Pattabhi Rama Rao. *Wind-Stress Misalignment in the Presence of Swells in the Bay of Bengal* (Manuscript under review)

[4] Praveen Kumar, B., **Raj, A.**, Sasidharan, A. K., Sureshkumar, N., Gnanaraj, A. A., Sankar, D., Ramasundaram, K., Jampana, V., & Rama Rao, P. R. (2025). INCOIS air-sea flux reference system onboard ORV Sagar Nidhi: Overview and initial results. *Frontiers in Marine Science*, (2025). DOI: <https://doi.org/10.3389/fmars.2025.1570854>

[3] **Raj, A.**, Praveen Kumar, B., Jampana, V., Suresh Kumar, N., Shivaprasad, S., Rama Rao, P. R., Srinivasa Kumar, T., & M. Ravichandran. (2024). Turbulent characteristics of momentum flux in the marine atmospheric boundary layer of North Bay of Bengal. *Scientific Reports*, (2024). DOI: <https://doi.org/10.1038/s41598-024-71819-z>

[2] **Raj, A.**, Praveen Kumar, B., Remya, P. G., Sreejith, M., & Balakrishnan Nair, T. M. (2023). Assessment of the forecasting potential of WAVEWATCH III model under different Indian Ocean wave conditions. *Journal of Earth System Science*, (2023). DOI: <https://doi.org/10.1007/s12040-023-02045-w>

[1] Sreejith, M., Remya, P. G., Praveen Kumar, B., **Raj, A.**, & Balakrishnan Nair, T. M. (2022). Exploring the impact of Southern Ocean sea ice on the Indian Ocean swells. *Scientific Reports*, (2022). DOI: <https://doi.org/10.1038/s41598-022-16634-0>

*** under review**

PRESENTATIONS

Ocean Society of India Conference (OSICON), India, <i>Poster presentation</i>	Feb 2025
IOPredict-2024 workshop, ITCOO, India, <i>Oral Presentation</i>	Dec 2024
WISE: Wind Waves in Earth System meeting, France, <i>Poster Presentation</i>	Apr 2024
AGU-Fall Meeting, USA, <i>Poster Presentation</i>	Dec 2023
Li-Cor Connect 2023 Conference and Workshop, USA, <i>Poster Presentation</i>	Nov 2023
Ocean Society of India Conference (OSICON), India, <i>Poster presentation</i>	Mar 2023
AGU Fall Meeting, Virtual, <i>Online Oral Presentation</i>	Dec 2022
Ocean Sciences Meeting (OSM 2022), Virtual, <i>Online Oral Presentation</i>	Mar 2022
International Indian Ocean Science Conference (IIOSC), Virtual, <i>Online Oral Presentation</i>	Mar 2022
Ocean Society of India Conference (OSICON), Virtual, <i>Online Oral Presentation</i>	Aug 2021

TRAININGS, WORKSHOPS & SEA-GOING EXPERIENCES

Training Course: "Moored ADCP Data Processing using PyADPS Software", International Training Centre for Operational Oceanography	Jan 2025
Training Course: "Ocean Data Management 2024", UNESCO/IOC Project Office for IODE	Feb 2024
Scientific Cruise: ORV Sagar Nidhi (SN-178), Arabian Sea	Jun 2023
Scientific cruise: CRV- Sagar Tara (ST-26), Bay of Bengal	Feb 2022
Training (Hands-on): "DCFS data processing" using the INCOIS Flux mooring data, WHOI-James B Edson held at INCOIS	Sep 2021
Training: "Eddy covariance Flux System (ECFS)-Installation and data collection", Tridel Technologies held at INCOIS	Jan 2021
Induction Training: "Earth System Sciences", Indian Institute of Tropical Meteorology (IITM, Pune)	Sep: Dec 2019
Scientific cruise: ORV Sagar Nidhi (SN-137), Arabian Sea	Jan 2019
Training: "Satellite Meteorology", Space Applications Centre, Indian Space Research Organization (ISRO)	Mar 2018
National Workshop: "Monsoons in the changing climate", Department of Atmospheric Sciences, CUSAT	2018
National Workshop: "Statistical Analysis & Computational Tools in Ocean Data Processing", Department of Physical Oceanography, CUSAT	2018

SERVICE & ENGAGEMENT

1. Member, "Rain Trackers": A community initiative tracking rainfall changes and enabling climate awareness among people from Malappuram, Kerala, India.
2. Member, ASLO (Association for the Sciences of Limnology and Oceanography)'s Student Resources and Activities Committee (SRAC) - 3 year voluntary term.
3. Member (*Life*), OSI (Ocean Society of India).
4. Member, AGU (American Geophysical Union).