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Research/teaching interests: Satellite Oceanography

- In-situ and remote sensing applications for advance understanding of the polar sea-ice, ocean-ice-atmosphere interaction, ocean color, and marine phytoplankton blooms in a warming climate.
- Retrieval and validation of oceanic environmental products from satellite observations to monitor the physical and biological processes in the marine environment.
- Exploration of sea floor features using multibeam swath bathymetric survey and satellite altimetry.

Academic background

2001-2007: Ph.D (Marine Science) from Berhampur University/NRSC, ISRO. Thesis title: Studies on the retrieval, validation and applications of geophysical parameters from MSMR onboard Indian Remote Sensing Satellite (IRS P4).

1999-2001: M.Phil (Marine Science), Berhampur University, India.

1996-1998: M.Sc (Oceanography, Specialization: Remote Sensing), Berhampur University, India.

PEER-REVIEWED SCIENTIFIC PUBLICATIONS

- Kshitija, S., **Jena, B.** and Bajish, C. C. (2025). Jet Stream Variability and Ocean-Atmosphere Forcing in Driving Sea Ice Extremes in the Ross Sea, Winter 2023. *International Journal of Climatology* e70052. <https://rmets.onlinelibrary.wiley.com/doi/10.1002/joc.70052>.
- **Jena, B.**, Kshitija, S., Bajish, C. C., Turner, J., Holmes, C., Wilkinson, J., Rahul M, Thamban, M., (2024). Evolution of Antarctic sea ice ahead of the record low annual maximum extent in September 2023. *Geophysical Research Letters*, 51, e2023GL107561. <https://doi.org/10.1029/2023GL107561> (IF: 5.576).
- **Jena, B.**, Turner, J., Reeves-Francois, T., C.C. Bajish, Holmes, C., Caton Harrison, T., Phillips, T., Wang, Z., (2024). Occurrence of unusual extensive ice-free feature within the pack ice of the central Weddell Sea, Antarctica in December 1980. *Nature Portfolio Journal: Climate and Atmospheric Science*, 7 (152). <https://www.nature.com/articles/s41612-024-00700-7> (IF: 9.448).
- Kshitija, S., **Jena, B.**, Bajish, C.C. Anilkumar, N., (2023). Recent Decline in Antarctic Sea Ice Cover From 2016 to 2022: Insights from Satellite Observations, Argo Floats, and Model Reanalysis. *Tellus A: Dynamic Meteorology and Oceanography*, 75(1), p.193–212 (IF: 2.247).
- Turner, J., Holmes, C., Harrison T C., Phillips, T, **Jena, B.**, Francois, T. R, et al., (2022). Record low Antarctic sea ice cover in February 2022. *Geophysical Research Letters*, 49, e2022GL098904. DOI: 10.1029/2022GL098904 (IF: 5.576).
- **Jena, B.**, Bajish, C.C., Turner, J., Ravichandran, M., Anilkumar, N., Kshitija, S., (2022). Record low sea ice extent in the Weddell Sea, Antarctica in April/May 2019 driven by intense and explosive

polar cyclones. *Nature Portfolio Journal: Climate and Atmospheric Science*, 5 (19), <https://www.nature.com/articles/s41612-022-00243-9> (IF: 9.448).

- **Jena, B.**, Bajish, C.C., Turner, J., Ravichandran, M., Kshitija, S., Anilkumar, N., et al. (2022). Mechanisms associated with the rapid decline in sea ice cover around a stranded ship in the Lazarev Sea, Antarctica. *Science of The Total Environment*, 821, 153379. <https://doi.org/10.1016/j.scitotenv.2022.153379> (IF: 10.753).
- Mishra, R. K., **Jena, B.**, Venkataramana, V., et al. (2022). Decadal changes in global phytoplankton compositions influenced by biogeochemical variables, *Environmental Research*, 206, <https://doi.org/10.1016/j.envres.2021.112546> (IF: 8.431).
- Bajish, C. C., **Jena, B.**, Anilkumar, N., (2021). Is the Indian monsoon rainfall linked to the Southern Ocean sea ice conditions? *Weather and Climate Extremes*, 34, 100377 (IF: 7.761).
- Anilkumar, N., **Jena, B.**, JV George., P. Sabu., S. Kshitija., M Ravichandran., (2021). Recent Freshening, Warming, and Contraction of the Antarctic Bottom Water in the Indian Sector of the Southern Ocean. *Frontiers In Marine Science* 8, DOI: 10.3389/fmars.2021.730630 (IF: 5.247).
- Anilkumar, N., Ravichandran, M., **Jena, B.**, (2020). Indian Scientific Expeditions to the Southern Ocean: Comprehensive surveys to understand atmospheric, physical, and biogeochemical processes. *Deep-Sea Research-II*, <https://doi.org/10.1016/j.dsr2.2020.104860> (IF: 2.887).
- Mishra, R.K., Naik, R.K., Vankara, V., **Jena, B.**, AnilKumar, N., Soares, M., Sarkar, A., et al., (2020). Phytoplankton biomass and community composition in the frontal zones of Southern Ocean. *Deep-Sea Research-II*, <https://doi.org/10.1016/j.dsr2.2020.104799> (IF: 2.887).
- Turner, J., Guarino, M. V., Arnatt, J., **Jena, B.**, Marshall, G., Phillips, T. et al., (2020). Recent decrease of summer sea ice in the Weddell Sea, Antarctica. *Geophysical Research Letters*, 47, e2020GL087127. <https://doi.org/10.1029/2020GL087127>. (IF: 5.576).
- **Jena, B.**, Anilkumar, N., (2020). Satellite observations of unprecedented phytoplankton blooms in the Maud Rise Polynya, Southern Ocean. *The Cryosphere*, 14, 1385-1358. <https://doi.org/10.5194/tc-14-1385-2020> (IF: 5.805).
- **Jena, B.**, Ravichandran, M., & Turner, J. (2019). Recent reoccurrence of large open-ocean polynya on the Maud Rise seamount. *Geophysical Research Letters*, 46, 4320–4329. <https://doi.org/10.1029/2018GL081482> (IF: 5.576).
- **Jena, B.**, Kumar, A., Ravichandran, M., Kern, S (2018) Mechanism of sea-ice expansion in the Indian Ocean sector of Antarctica: Insights from satellite observation and model reanalysis. *PLOS ONE* 13 (10): e0203222. <https://doi.org/10.1371/journal.pone.0203222>. (IF: 3.752).
- **Jena, B.**, (2018). Phytoplankton blooms in the Southern Ocean: Through satellite observations. *Geography and You*. <https://www.geographyandyou.com/phytoplankton-blooms-in-the-southern-ocean-through-satellite-observations/>
- Tripathy, S.C., **Jena, B.**, (2019). Iron-Stimulated Phytoplankton Blooms in the Southern Ocean: a Brief Review. *Remote Sensing of Earth System Sciences (Springer)*, 2, 64–77 (2019). <https://doi.org/10.1007/s41976-019-00012-y>.
- **Jena, B** (2017), Effect of phytoplankton pigment composition and packaging on the retrieval of chlorophyll-a concentration from satellite observations in the Indian sector of Southern Ocean. *International Journal of Remote sensing (Taylor & Francis)*, 38 (13), 3763-3784, ISSN: 1366-5901, doi: 10.1080/01431161.2017 (IF: 3.531).
- Shetye, S., **Jena, B.**, Mohan, R., (2017), Dynamics of sea-ice biogeochemistry in the coastal Antarctica during transition from summer to winter. *Geoscience Frontiers (Elsevier)*, 8 (3), 507-516. ISSN: 1674-9871, doi: <http://dx.doi.org/10.1016/j.gsf.2016.05.002> (IF: 7.483).

- Mishra, R.K., **Jena, B.**, Anilkumar, N., Sinha, R.K., (2017). Shifting of phytoplankton community in the frontal regions of Indian Ocean sector of the Southern Ocean using in situ and satellite data. *Journal of Applied Remote Sensing (SPIE)*, 11 (1), doi: 10.1117/1.JRS.11.016019. (IF: **1.568**).
- Mishra, R.K., **Jena, B.**, Anilkumar, N., Krishna NR, Bhaskar, P.V., (2017). Variability of chlorophyll-a and diatoms in the frontal ecosystem of Indian Ocean sector of the Southern Ocean. *Polish Polar Research*, 38 (3), 375-392, ISSN: 2081-8262, doi: 10.1515/popore-2017-0014 (IF: **0.900**).
- Sasmal, S. K., **Jena, B.**, (2016), Monitoring of ocean environmental changes under influence of cyclonic system: Utilization of SARAL and contemporary satellite observations. *Remote Sensing Applications: Society and Environment (Elsevier)*. ISSN: 2352-9385, doi: 10.1016/j.rsase.2016.10.003.
- **Jena, B.**, Kurian, P.J., Kumar, A (2016), Morphology of submarine channel-levee systems in the eastern Bay of Bengal near Andaman region. *Journal of Coastal Conservation (Springer)*, 20 (3), 211–220, ISSN: 1874-7841, doi:10.1007/s11852-016-0431-2 (IF: **2.098**).
- **Jena, B** (2016), Satellite remote sensing of Island mass effect on the sub-Antarctic Kerguelen Plateau, Southern Ocean. *Frontiers of Earth Science (Springer)*, 10 (3), 479–486. ISSN: 2095-0209, doi: 10.1007/s11707-016-0561-8 (IF: **2.273**).
- Shetye, S., Mohan, R., Patil, S., **Jena, B.**, Chacko, R., George, J.V., Noronha, S., Singh, N., Priya, L., Sudhakar, M. (2015), Oceanic pCO₂ in the Indian sector of the Southern Ocean during the austral summer–winter transition phase. *Deep-Sea Research-II (Elsevier)*, 118, 250–260. ISSN: 0967-0645, doi: <http://dx.doi.org/10.1016/j.dsr2.2015.05.017> (IF: **2.887**).
- Shetye, S., Sudhakar, M., Mohan, R., **Jena, B.**, (2014), Contrasting Productivity and Redox Potential in Arabian Sea and Bay of Bengal. *Journal of Earth Science, (Springer)*, 25 (2), 366–370. ISSN: 1867-111X, doi: 10.1007/s12583-014-0415-9 (IF: **2.433**).
- Shetye, S., Sudhakar, M., **Jena, B.**, Mohan, R. (2013), Occurrence of Nitrogen Fixing Cyanobacterium *Trichodesmium* under Elevated pCO₂ Conditions in the Western Bay of Bengal. *International Journal of Oceanography (Hindawi)*, ArticleID-350465, 8pages, ISSN: 1687-9406, doi: <http://dx.doi.org/10.1155/2013/350465>.
- Rajendran, C. P., Andrade, V., Jaishri, S., Kurian, J., **Jena, B.**, (2013), Constraining large earthquakes along the Andaman trench using deepwater turbidites: prospects and challenges. *Current Science*, 104 (10), 1300-1307. ISSN: 0011-3891 (IF: **1.169**).
- Kumar, A., **Jena, B.**, Vinaya, M.S., Jayappa, K.S., Narayana, A.C., Bhat, G.H., (2012), Regionally tuned algorithm to study the seasonal variation of suspended sediment concentration using IRS-P4 Ocean Colour Monitor data. *The Egyptian Journal of Remote Sensing and Space Sciences (Elsevier)*, 15, 67–81. ISSN: 1110-9823, doi: <http://dx.doi.org/10.1016/j.ejrs.2012.05.003> (IF: **6.393**).
- **Jena, B.**, Sahu, S., Kumar, A., Swain, D., (2013), Observation of oligotrophic gyre variability in the south Indian Ocean: Environmental forcing and biological response. *Deep-Sea Research-I (Elsevier)*, 80, 1-10. ISSN: 0967-0637, doi: 10.1016/j.dsr.2013.06.002 (IF: **3.101**).
- **Jena, B.**, Kurian, P.J., Swain, D., Tyagi, A., Ravindra, R., (2012), Prediction of bathymetry from satellite altimeter based gravity in the Arabian Sea: Mapping of two unnamed deep seamounts. *International Journal of Applied Earth Observation and Geoinformation (Elsevier)*, 16, 1–4. ISSN: 0303-2434, doi: 10.1016/j.jag.2011.11.008 (IF: **7.672**).
- **Jena, B.**, Swain, D., Kumar, A., (2012), Investigation of the biophysical processes over the oligotrophic waters of South Indian Ocean subtropical gyre triggered by cyclone Edzani. *International Journal of Applied Earth Observation and Geoinformation (Elsevier)*, 18, 49–56. ISSN: 0303-2434, doi: 10.1016/j.jag.2012.01.006 (IF: **7.672**).
- **Jena, B.**, Rao, M. V., Sahu, S., Sahu, B. K., (2011), A comparative assessment of IRS-P4 (MSMR) derived sea surface temperature and sea surface wind speed over the north Indian Ocean.

International Journal of Remote sensing (Taylor & Francis), 32 (24), 9879-9891, ISSN: 1366-5901, doi: 10.1080/01431161.2011.562932 (IF: 3.531).

- **Jena, B.**, Swain, D., Tyagi, A., (2010), Application of artificial neural networks for sea surface wind speed retrieval from IRS-P4 (MSMR) brightness temperature. *IEEE Geoscience and Remote Sensing Letters, IEEE (GSRL)*, 7 (3), 567-571, ISSN: 1545-598X, doi:10.1109/LGRS.2010.2041632 (IF: 5.343).
- **Jena, B.**, Rao, M.V., Sahu, B. K., (2006), TRMM derived sea surface temperature in the wake of a cyclonic storm over the central Bay of Bengal. *International Journal of Remote sensing (Taylor & Francis)*, 27 (14), ISSN: 1366-5901, 3065–3072, doi: 10.1080/01431160600589187 (IF: 3.531).
- **Jena, B.**, S. K. Sasmal, M. V. Rao, M. M. Ali (2006), Inter comparison of NOAA-AVHRR and IRS-P4 (MSMR) derived Sea Surface Temperatures: Possibility of blending two observations. *International Journal of Remote sensing (Taylor & Francis)*, 27 (15), 3123–3130, ISSN: 1366-5901, doi: 10.1080/01431160600580608 (IF: 3.531).
- Choudhury, S. B., **Jena, B.**, M. V. Rao, K. H. Rao, V. S. Somvanshi, D. K. Gulati and S. K. Sahu (2007), Validation of integrated potential fishing zone forecast using satellite based chlorophyll and sea surface temperature along the east coast of India. *International Journal of Remote sensing (Taylor & Francis)*, 28 (12), 2683 – 2693, ISSN: 1366-5901, doi: 10.1080/01431160600987878 (IF: 3.531).
- **Jena, B.**, Sudarshana, R., Chaudhary, S. B., (2003), A study on spatial distribution of water quality parameters around the Sagar Island, Sunderbans. *J. Nature Env. and pollu. Tech.*, 2 (3), 329-332, ISSN: 0972-6268.
- **Jena, B.**, Sudarshana, R., Chaudhary, S. B., (2003), An environmental inventory of Sagar Island using IRS-1C LISS-III data. *J. Nature Env. and pollu. Tech.*, Vol.2 (4), 405-409, ISSN: 0972-6268.

Books/Chapters/Policy Documents

- Changes in seasonality and extent of Antarctic sea ice cover over the satellite record. (2026). Comprehensive Cryospheric Science and Environmental Change, Vol. 2, pp. 328–349. Elsevier. ISBN: 978-0-323-85242-5. DOI: 10.1016/B978-0-323-85242-5.00032-4.
- Exploring the Dynamics of Antarctic Sea Ice over Four Decades Using Geospatial Technology. (2023). In Climate Crisis: Adaptive Approaches and Sustainability, Sustainable Development Goals Series, pp. 35–52. Springer Nature, Switzerland. DOI: 10.1007/978-3-031-44397-8_3.
- Understanding the link between atmospheric, physical and biogeochemical processes in the Indian sector of the Southern Ocean. (2020). Deep-Sea Research Part II, 178, Special Issue. Elsevier.
- Rapid sea ice decline and its causes and consequences (2026). Antarctica InSync Scientific, Theme 2, pp. 1–16. DOI: 10.67382/OXEJ8569. Scientific White Paper. — Contributing Author.
- Science Plan: Antarctica InSync (2026). Scientific Committee on Antarctic Research (SCAR). DOI: 10.67382/EACD5221. International Scientific Plan — Contributing Author.

EDITORIAL POSITIONS

- Guest Editor, Deep-Sea Research-II (Elsevier)
- Associate Editor, Remote Sensing in Earth System Sciences (Springer)
- Editorial Board Member, Discover Oceans (Springer)
- Editorial Board Member, Journal of Water Resources and Ocean Science.

Awards/Honours

- Received Ministry of Earth Science (Government of India) Award: Merit Scientist for the year 2020 for outstanding contribution in the field of Polar Science and Technology.
- AGU GRL Top-Viewed Article Recognition, 2024
- Fellowship awarded by National Remote Sensing Centre, ISRO, during 2001-2005.

Scientific expeditions for National/International programmes

2010: Deputy Chief Scientist, Akademik Boris Petrov — Indian EEZ survey and mapping.
2010: Chief Scientist, ORV Sagar Kanya (SK-273) — Indian EEZ survey and mapping.
2010: Chief Scientist, ORV Sagar Kanya (SK-275) — Indian EEZ survey and mapping.
2011: Chief Scientist, ORV Sagar Kanya (SK-286) — Indian EEZ survey and mapping.
2012: Chief Scientist, ORV Sagar Kanya (SK-292) — Indian EEZ survey and mapping.
2012: Chief Scientist, ORV Sagar Kanya (SK-299) — hydrothermal studies.
2012: Chief Scientist, Akademik Nikolay Strakhov — hydrothermal studies.
2015: Member, 34th Indian Scientific Expedition to Antarctica.
2020: Member, 11th Indian Scientific Expedition to the Southern Ocean.

SCIENTIFIC RESEARCH PROJECTS

Current international projects:

Project 9: Drivers and Effects of Fluctuations in Sea Ice in the Antarctic (DEFIANT). Funding Institution: British Antarctic Survey (Cambridge, United Kingdom), Natural Environment Research Council-DEFIANT NE/W004747/1, Funding value: ~£5 million. This project is aimed to foster collaborative efforts and enhance step change understanding of the factors influencing fluctuations in sea ice within the Antarctic region.

Project 8: Ocean observations and indicators for climate and assessments (ObsSea4Clim). The project was sanctioned by MoES (MoES/EU/Horizon Europe/1/2022-PC) and the European Union (EU) on 05/04/2024 to improve sustained and multipurpose observations vital to European and global climate requirements.

Previous projects:

Project 7: Variability of remote sensing reflectance of the waters around Antarctic continent—implications to retrieval of chlorophyll-a from an optical sensor for studying biogeochemical cycle in the high latitude waters. **Role:** Principal Investigator. Participated in scientific expedition to Antarctica.

Project 6: Hydrothermal mineralization study in the Indian Ocean. **Role:** Chief Scientist for carrying out scientific operations for exploration of seafloor massive hydrothermal sulfide ore deposits in the Central Indian Ridge and South-west Indian Ridge. This work contributed India's successful ISA seabed claim.

Project 5: Swath bathymetric multibeam survey and mapping of the exclusive economic zone of India. **Role:** Chief Scientist for cruise/survey planning, data acquisition, processing, quality evaluation, map preparation and interpretation of seabed morphology/ Bathymetry retrieval from satellite altimeter.

Project 4: Development of marine geo-scientific database (MGSDb) at NCPOR. **Role:** Overall coordination.

Project 3: Generation of Ocean color and mixed layer primary production climatic atlas over the North Indian Ocean using IRS-P4 (OCM) data. **Role:** Processed entire mission record of IRS-P4 OCM-1 for chlorophyll-a and ocean primary production atlas generation.

Project 2: Synergistic study of AVHRR SST and IRS-P4 OCM chlorophyll for generation of integrated PFZ forecast. **Role:** Cruise participation for collection of in-situ bio-optical data, evaluation of bio-optical models, development of algorithms for retrieval of biophysical parameters from satellite data.

Project 1: Retrieval and validation of geophysical parameters from IRS-P4 (MSMR) for studying climatic anomalies of the north Indian Ocean. **Role:** Development of algorithms for retrieval and validation of SST and wind from IRS-P4 (MSMR).

RECOGNISED Ph.D GUIDE

- Mangalore University
- Bharathidasan University
- Goa University
- Pune University

OTHER PROFESSIONAL CONTRIBUTIONS

- **National Representative from India:** SCAR Physical Sciences; Antarctic InSync.
- **Ph.D. Thesis Examiner:** Various universities, NITs, and the University of Cape Town (UCT).
- **Journal Reviewer:** Nature, Geophysical Research Letters, Journal of Geophysical Research, International Journal of Remote Sensing, and 7 other journals (11 in total).
- **Research Guidance & Capacity Building:** 4 Ph.D. scholars, 3 Postdoctoral Researchers, and 25 M.Sc./M.Tech. students.
- **Conference Sessions:** Coordinated two sessions at the National Conference on Polar Sciences; one session at the 36th International Geological Congress ("A Unique Opportunity for Advancement in Geosciences"); three sessions at the International Indian Ocean Science Conference (IIOSC) 2022; session convener, SCAR 2022, 2024.
- **Committee Member:** Recruitment committees for Research Scientists, Assistant Professors, and Junior Research Fellows.

TECHNICAL SKILLS

- Programming : IDL, EML Scripting, CDO, GRADS.
- Image Processing/GIS : ArcGIS, ERDAS Imagine, ENVI, SeaDAS, CARIS HIPS/SIPS, Fledermaus.
- Statistical packages : GrADS, ODV, Statistica, Minitab, SPSS, Surfer, Grapher, Tecplot.
- * *Excellent experience in sea-ice, thermal & ocean color data analysis.*

Place: Vaso-da-gama, Goa, India

(Dr. Babula Jena)

Date: