IIOE-2 2nd International Indian Ocean Expedition 2015-2025

Newsletter

(A basin-wide research program co-sponsored by IOC-UNESCO, SCOR and IOGOOS)

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To advance our understanding of interactions between geologic, oceanic and atmospheric processes that give rise to the complex physical dynamics of the Indian Ocean region, and to determine how those dynamics affect climate, extreme events, marine biogeochemical cycles, ecosystems and human populations.

Scientific field campaigns in the southeastern Arabian Sea during the initial and peak phases of summer 2023 under the EKAMSAT programme

The Arabian Sea has a vital role in shaping the climatic patterns of the Indian Ocean region in various spatiotemporal scales. According to recent research, this body of water is experiencing faster warming and regional climate shifts, which could intensify extreme weather occurrences like tropical cyclones, and it may also significantly impact the marine ecosystem and fisheries. Recognizing the growing scientific importance of the Arabian Sea, a joint research initiative was formulated between India and the United States of America, titled Enhancing Knowledge of the Arabian Sea Marine Environment through Science and Advanced Training" (EKAMSAT). Under the EKAMSAT programmes, it is proposed to conduct several field campaigns in the Arabian Sea by Indian and US teams to collect fine-scale oceanographic and atmospheric measurements, focusing on examining surface mixed layer/interior ocean processes and marine atmospheric boundary layer processes and their representations in numerical models.

Figure: The scientific team onboard (left) Sagar Nidhi and (right) Roger Revelle during the EKAMSAT

As a pilot phase of this programme, INCOIS conducted a month-long scientific cruise in the Arabian Sea from June 29 to July 24, 2023, onboard the Ministry of Earth Sciences research vessel Sagar Nidhi, immediately following the field campaign by a US-India team onboard Roger Revelle during June 10-25, 2023, to collect fine-scale oceanographic and atmospheric measurements using vertical microstructure profiler, ship-based eddy covariance flux system, lowered acoustic Doppler current profiler and Radiosonde. In addition, water samples were collected as part of these two expeditions to study the factors that modulate biogeochemical parameters. The field campaigns were focused on the southeastern Arabian Sea, a region known for its pivotal role in the onset and progression of the Indian summer monsoon. Following the Rover Revelle voyage, the observation campaign onboard Sagar Nidhi was aimed at comprehending the unique characteristics of air-sea interaction processes in the Arabian Sea during the initial and peak phases of the summer monsoon 2023.

These fine-scale measurements from the Arabian Sea aim to improve our understanding of the small-scale mixing processes in the ocean surface boundary layer, interior ocean, and air-sea interaction processes. The measurements will also aid in investigating how best these processes are represented in existing parameterization schemes in ocean and atmospheric coupled models, thereby improving the accuracy of physical process representations and reducing systematic erroneous monsoon predictions.

[Report Courtesy: Dr. Girishkumar M. S., Scientist-E, INCOIS, Hyderabad, Telangana, India, E-mail: girish@incois.gov.in]

Assessing Ecotourism Sustainability for Irrawaddy Dolphin in a Tropical Lagoon

Nestled along the eastern coast of India, Chilika stands as Asia's largest brackish water lagoon, renowned for its breathtaking beauty and unique ecosystems. Among its prized inhabitants are the enchanting Irrawaddy Dolphins (IRD), drawing tourists from far and wide for a chance to witness these charismatic creatures in their natural habitat. However, the growing popularity of dolphin-based tourism in Chilika has raised concerns about its long-term sustainability. A recent study has delved into the complex dynamics of IRD-based tourism in Chilika, utilizing a combination of SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, content analysis, sentiment analysis, and telephonic interviews with local boat owners. The goal is to gain a comprehensive understanding of the factors affecting this tourism sector and its impact on the local community, and the environment.

Strengths: These elusive dolphins, with their distinctive appearance and cultural significance, serve as a strong foundation for ecotourism in the region. Their presence is complemented by the lagoon's rich biodiversity and scenic beauty, offering an enticing blend of nature and culture.

Weaknesses: The fragile ecosystem of the lagoon demands careful management to prevent harm to the dolphins and their habitat. Limited infrastructure and awareness of sustainable tourism practices among local communities are challenges that require attention.

Opportunities: Sustainable ecotourism promises not only economic benefits but also the engagement of local communities in conservation efforts. Collaborations with conservation organizations and responsible tourism operators can unlock this potential, while educational programs can enhance the visitor experience.

Threats: Irresponsible tourism practices, along with habitat degradation, pollution, and boat traffic, pose significant threats to the dolphins. Striking a balance between economic gains and conservation is a pressing challenge.

This research also underscores significant knowledge gaps surrounding the impact of tourism on IRD biology and behaviour. For instance, the effects of boat-generated sound pollution on IRD echolocation and mating behavior remain largely unknown. Similarly, the influence of water quality, climate change, land use, and land cover changes on IRD and tourism demands further exploration. Additionally, sentiment analysis among local communities, tourists, and conservationists sheds light on perceptions and attitudes towards ecotourism. Positive sentiments can be seen as an encouraging sign for the prospects of sustainable ecotourism, while negative sentiments pinpoint areas needing improvement. The authors advocate for greater collaboration in understanding the behaviour and biology of dolphins, refining tour operator best practices, and aligning with the conservation strategies of state government. These interdisciplinary efforts encompass scientific, cultural, and economic aspects of ecotourism and hold the potential to stimulate a "blue economy" in Chilika, creating sustainable employment opportunities for local communities. As Asia's largest brackish water lagoon continues to captivate both locals and tourists alike with its remarkable Irrawaddy dolphins, this multifaceted analysis offers valuable insights into how we can preserve this natural wonder while promoting responsible and sustainable tourism practices.

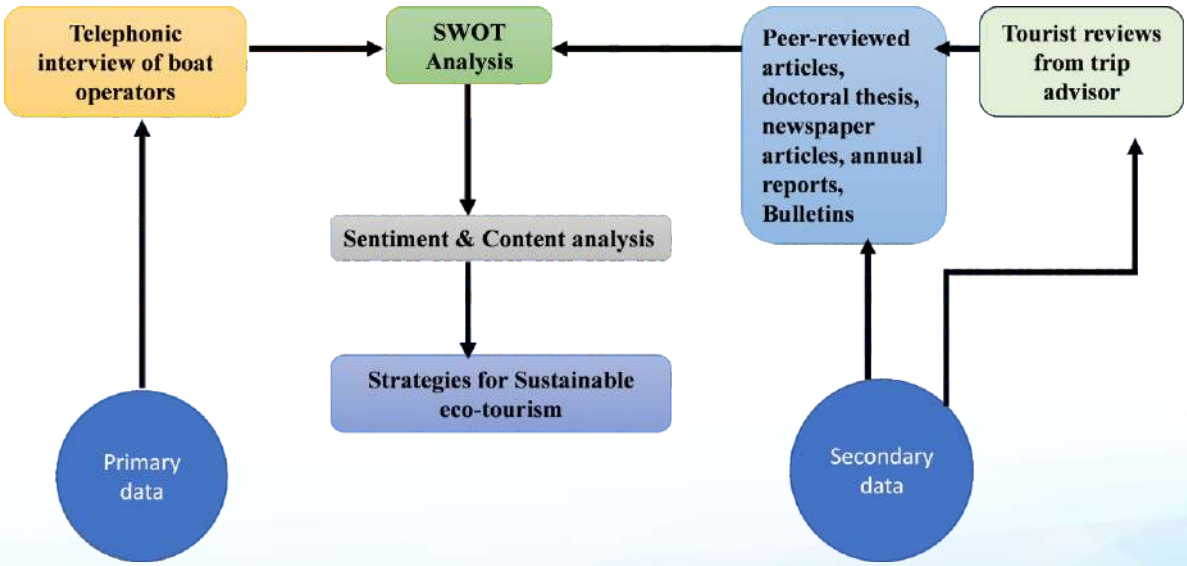


Diagram illustrating the framework for performing SWOT and sentiment analysis. (Image reprinted with permission from Elsevier Acharyya et al. 2023).

Citation: Acharyya, T., Sudatta, B.P., Das, D.B., Srichandan, S., Baliarsingh, S.K., Raulo, S., Singh, S., Samal, R.N., Mishra, M. and Bhat, I. (2023). Irrawaddy dolphin in Asia's largest brackish water lagoon: A perspective from SWOT and sentiment analysis for sustainable ecotourism. Environmental Development, 46, 100863.
https://doi.org/10.1016/j.envdev.2023.100863

[Report Courtesy: Dr. Suchismita Srichandan (suchismita.sima@gmail.com), Dr. Tamoghna Acharyya (acharyya.tamoghna@gmail.com), Berhampur University, India, & Dr. Sanjiba Kumar Baliarsingh (baliarsingh.s@incois.gov.in), INCOIS, Hyderabad, India.]

Invited Early Career Ocean Professional (ECOP) talks at the OSICON-23, INCOIS, Hyderabad, India.

The Eighth National Conference of the Ocean Society of India (OSICON-23) was held at the Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, during 23-25 August, 2023. OSICON-23 created history, as for the first time, ECOPs from premiere oceanographic institutions of India got an opportunity to deliver invited talks in each of the 14 subthemes of the conference. ECOPs explained the latest advancements in the Indian oceanographic realm through their path breaking research and elucidated how their work aligned with the sustainable goals of the UN Ocean decade.

The ECOPs also conducted an informal workshop wherein they discussed the challenges and expectations of the ECOPs in their academic journey. Fruitful discussions led to furthering the cause of the ECOPs and exploring the possibility of future ECOP participation in upcoming oceanographic conferences in India.

[Report Courtesy: Trishneeta Bhattacharya, INCOIS, Hyderabad, India; E-mail: t.bhattacharya-rf@incois.gov.in]

Join us for the Ocean Insights – Indian Ocean Seminar Series feat. ECRs. !

The IIOE-2 Early Career Scientist Network is thrilled to present yet another exciting talk of "Ocean Insights – Indian Ocean Seminar Series feat. ECRs", designed especially for early career scientists focusing on the Indian Ocean to share about their research. This captivating seminar series offers a unique opportunity for the Early Career Researchers to showcase their work, build connections, and explore collaborations within the marine sciences community.

Whether you are an early career researcher, an experienced scientist, or simply an enthusiast seeking to broaden your knowledge of marine science in the Indian Ocean, **ALL ARE INVITED!**

Why Should You Join?

- Engaging presentations from early career marine scientists.
- Interactive Q&A sessions to delve deeper into research topics and foster innovative ideas.
- A platform to connect with like-minded researchers and experienced scientists.

Don't miss out on the opportunity to enhance your understanding of marine science in the Indian Ocean and connect with fellow researchers. Register now and mark your calendars!

Details on the upcoming talk are given below. We look forward to your enthusiastic participation!

Key Details:

Title: Ocean Insights – Indian Ocean Seminar Series feat. ECRs ; Region: Indian Ocean; Format: Online
Link: https://zoom.us/meeting/register/tJUudOGsrzkiHNzP_5mFIjstUxIUQBhS6Z-_
Date: Every first Friday of the month, starting on **06th October 2023**
Time: 10:30-11:30 SAST ; 14:00-15:00 IST; 16:30-17:30 AWST

If you are enthusiastic about sharing your contributions, please reach out to us at the email address: ecsn.iioe@gmail.com

ICES - PICES 7th International Zooplankton Production Symposium during Autumn17-22 March 2024, Hobart, Australia

SCOPE

We are living in the Anthropocene. Our oceans are warmer, more acidic, have widespread plastic and other pollution, and are subjected to increasing exploitation including overfishing. Zooplankton play a pivotal role in our oceans, as grazers of primary production, as drivers of carbon and nutrient cycles, and as prey for higher trophic level consumers including both harvested fish species and iconic marine mammals and seabirds. How zooplankton will respond to the dramatic changes in our marine ecosystems will impact the health and productivity of our oceans and our planet.

To better understand zooplankton in a changing world, ICES and PICES are holding the 7th International Zooplankton Production Symposium as a forum to discuss the latest zooplankton research. The ICES/PICES Zooplankton Production Symposium will bring together the top zooplankton researchers globally, showcasing recent advances. Understanding the current and evolving role of zooplankton will require new insights provided by:

- Assessing the impact on zooplankton of climate change, fishing, and pollution such as microplastics
- State-of-the-art sampling techniques such as DNA, imaging, and bioacoustics
- Biochemical methods applied to unravelling complex trophic ecology
- The application of cutting-edge approaches in zooplankton modelling, including size and trait-based biogeochemical and ecosystem models
- Revealing the role of microzooplankton in biogeochemical cycling and food webs
- Exploring the structure and functioning of macrozooplankton communities and their impact on carbon sequestration and trophic ecology
- Examining zooplankton in fisheries science, including dynamics of fish larvae, the impact of zooplankton on fish larval mortality and growth, and the commercial harvest of zooplankton
- Elucidating the vital role of zooplankton in polar environments
- Understanding the role of gelatinous filter feeders and jellyfish in carbon sequestration and trophic ecology
- The use of zooplankton as ecosystem indicators in a changing ocean

Our Symposium will be held over five days in the historic waterfront district of Hobart, Australia, during Autumn, from 17-22 March 2024. This event will be held in-person and provide the first opportunity since 2016 for zooplankton researchers to meet, build networks, and hear the latest science. We are monitoring the COVID-19 situation closely and will adapt our plans as needed.

The Organizing Committee invites proposals for sessions to be held during the Symposium. Proposals are welcome for sessions incorporating talks and posters, panel discussions and/or workshops. Sessions could cover, but are not limited to, the key areas listed above.

The symposium website may be accessed here: https://meetings.pices.int/meetings/international/2024/zps7/scope

Proposals may be submitted here: https://meetings.pices.int/meetings/international/2024/zps7/proposals

12th International Conference and Workshop on Lobster and crabs 22-27 October 2023 in Fremantle, Western Australia

The Organising Committee of the 12th International Conference and Workshop on Lobster and crab is pleased to announce the go ahead of this workshop that was originally planned for October 2020, for **22-27 October 2023. Please check the website** (https://icwl2023.com.au) **for updates on the conference.** This will be updated over the next month with more details on the program. We will be accepting abstracts and registrations from the 24 January 2023. This workshop is being planned as a face-to-face meeting.

The overall theme for the 2023 workshop is **'Ecosystem-based fisheries management (EBFM)'** as this generally represents best practice for fisheries management and reflects that fisheries research and management focus is now broader than just sustainability. Therefore we hope to attract presentations that cover a wide array of subjects under the EBFM banner including biology, stock assessment, management, ecosystem effects of fishing such as interaction with whales, habitat, economics, social, governance and management compliance.

We will be holding a **2-day EBFM workshop** which will be sponsored by the OECD Co-operative Research Programme: Biological Resource Management for Sustainable Agricultural Systems. This will occur on the first two days of the 5-day conference.

While this conference comes back to Western Australia where the 1st International Lobster Workshop was held in 1978, we have adopted the approach of the 2nd lobster conference in St Andrews in 1985 where **crab presentations** were welcome. We look forward to their participation in this conference.

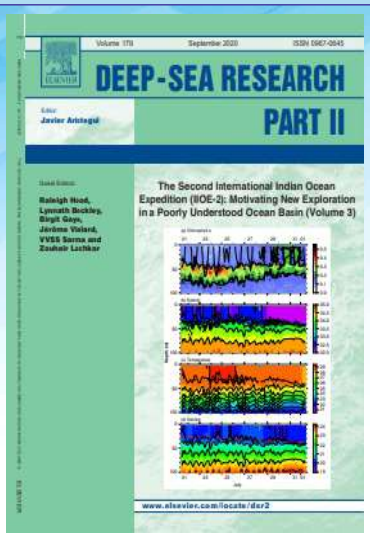
An **industry day** is also planned for Thursday 26 October and this is an important component of the program so we are looking forward to strong support from lobster and crab industry participants around the world. We are also keen to attract papers on **lobster and crab aquaculture** as this has been an important developing industry in Asia.

Students can apply for the **Paul Kanciruk Student award** for financial support to attend the conference.

The Department of Primary Industry and Regional Development (DPIRD) and the Western Rock Lobster (WRL) council are looking forward to hosting scientists, managers and industry participants in Western Australia in 2023. Don't hesitate to contact us or the conference organisers, Arinex, if you have any questions.

Co-hosts of the workshop Nick Caputi, DPIRD (nick.caputi@dpird.wa.gov.au) & Nic Sofoulis, WRL (sofs1@bigpond.com).

DEEP-SEA RESEARCH PART II



THE SUBMISSION PORTAL FOR VOL. 6 OF THE DEEP-SEA RESEARCH II SPECIAL ISSUE SERIES ON THE IIOE-2 IS NOW OPEN

Submission of manuscripts that describe the results of studies related to the physical, chemical, biological, and/or ecological variability and dynamics of the Indian Ocean (including higher trophic levels) is encouraged.

Submission of manuscripts from students and early career scientists is also encouraged.

If you are interested in submitting a manuscript, please contact Raleigh Hood (rhood@umces.edu).

XI Indo-Pacific Fish Conference to be held in Auckland, New Zealand during 20-24 November 2023

A session entitled Larval fishes - solving phylogenetic, life-cycle and ecological questions will be part of the XI Indo-Pacific Fish Conference to be held in Auckland, New Zealand from 20-24 November 2023.

Most marine bony fishes have a two-phase life history with pelagic larvae that differ in morphology, ecology and habitat from the adults. These phases operate in separate evolutionary theatres, and ecologically, effectively function as separate species. Larval morphological features provide characters for phylogenetic analysis and aspects of life history are determined during the larval phase, including recruitment and scale of genetic and demographic connectivity. Although larval survival is necessary for persistence of species, larvae are often neglected by researchers and managers focused on adults. This session will address many of the unanswered questions about the pelagic larval phase of Indo-Pacific fishes.

The session will be co-chaired by
- Jeff Leis (University of Tasmania; jeffrey.leis@utas.edu.au)
- Lynnath Beckley (Murdoch University; L.Beckley@murdoch.edu.au) and
- Ainhoa Bernal (Institut de Ciències del Mar; bernal@icm.csic.es)

Those interested in contributing to the larval fish session should contact one of the session co-chairs.

Final programme available on 20 October 2023

The conference website is https://www.ipfc11-asfb.ac.nz/

Endorse your projects in IIOE-2

Don't miss the opportunity to network, collaborate, flesh out your research project and participate in IIOE-2 cruises!!

The endorsement of your scientific proposal or a scientific activity focusing on the Indian Ocean region is a recognition of the proposal's or activity's alignment with the mission and objectives of IIOE-2, of its potential for contributing to an increased multi-disciplinary understanding of the dynamics of the Indian Ocean, and of its contribution to the achievement of societal objectives within the Indian Ocean region. Over 51 international, multi-disciplinary scientific projects have already been endorsed to date by the IIOE-2. Yours could be the next one!

Visit https://iioe-2.incois.gov.in/IIOE-2/EndorsementForm.jsp for further details and for projects already endorsed by IIOE-2 https://iioe-2.incois.gov.in/IIOE-2/Endorsed_Projects.jsp.

CLIVAR September 2023 Bulletin is available online

The International CLIVAR Project Office distributes a monthly bulletin with announcements, funding opportunities, meeting notifications relevant to the ocean/climate science community.

The latest CLIVAR Bulletin September, 2023 is available at:
https://www.clivar.org/clivar-bulletin

Call for Contributions

Informal articles/short notes of general interest to the IIOE-2 community are invited for the next (October-end) issue of the IIOE-2 Newsletter. Contributions referring IIOE-2 endorsed projects, cruises, conferences, workshops, "plain language summary" of published papers focused on the Indian Ocean etc. are welcome. Articles may be up to 500 words in length (Word files) accompanied by suitable figures, photos.(separate.jpg files).

Deadline: **25 October, 2023**

The Indian Ocean Bubble 2

Access the latest issue of Indian Ocean Bubble-2
https://iioe-2.incois.gov.in/IIOE-2/Bubble.jsp

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