

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

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.

The first meeting of the WIO N.O.I.S.E. network in Mauritius

The recently created scientific network on Western Indian Ocean National Or International SEamounts, banks, submarine structures (WIO N.O.I.S.E.) held its first Workshop “Multidisciplinary Scientific Approaches to Support Marine Regional Governance in the Western Indian Ocean” in Mauritius from 3 to 5 May 2023 (Figure-1). The workshop was hosted by the Department for Continental Shelf, Maritime Zones Administration and Exploration (CSMZAE) of the Prime Minister's Office and by the University of Mauritius (UOM).



Figure-1: The first WIO N.O.I.S.E. Workshop
(3-5 May 2023, Mauritius)
Credit: JF Ternon, IRD

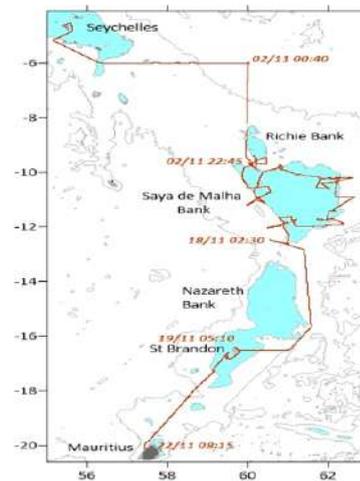


Figure-2: Cruise tracks of the second leg of the Monaco expedition, from Seychelles to Mauritius, through Saya de Malha Bank and St Brandon
Credit: Courtesy of F. Marsac, scientific leader of the Saya de Malha operation

The WIO N.O.I.S.E. network aims at gathering regional researchers, students, policy makers and institutions interested in marine ecosystems' functioning, conservation and governance associated with seamounts and shallow topographic structures in national waters, continental shelves as well as in the high seas. This may concern scientific knowledge of these ecosystems, aspects of their exploitation and/or conservation, legal issues related to the international regulations.

The network, launched at the 12th WIOMSA Symposium held at Gqeberha (previously known as Port Elizabeth, South Africa) in October 2022, was initiated by the component of the IRD DiDEM project (France, www.didem-project.org) devoted to High Seas, Remote and/or Deep Seabed & ABNJ (Area Beyond National Jurisdiction), funded by IRD, FFEM (French Facility for Global Environment), Monaco Explorations and supported by UNDP through partnership with the WIO LME SAPPHERE, Nairobi Convention and WIOMSA.

The partnerships enabled by WIO N.O.I.S.E. was strengthened during the Indian Ocean Expedition conducted by Monaco Explorations in October-November 2022, specifically during the second part of the cruise on the Saya de Malha Bank (Figure-2), which contributed to increasing our knowledge on this Joint Management Area (JMA) established to manage concurrently the Mauritius and Seychelles continental shelves. This WIO N.O.I.S.E. workshop was a great opportunity to gather the main parties from this expedition and consolidate their collaborations.

The workshop organization was strongly supported by the two Mauritian institutions (CSMZAE and UOM). The first two days (at CSMZAE) gathered about 40 participants from France (mainland, Reunion Island), Mauritius, Seychelles, Madagascar. J.D. KOONJUL (Permanent Representative of Mauritius to the UN) opened the meeting (Figure-3). The meeting (with more than 30 presentations) covered four themes: (1) marine and legal sciences interaction, (2) science support to Marine Spatial Planning, (3) importance of physical and biological in situ data for public and conservation actions, (4) marine and coastal connectivity. The closing session was led by Dr Rezah BADAL (Director General of CSMZAE), Dr Florence GALLETTI (IRD) and Dr Francis MARSAC (IRD) (Figure-4) who gave an overview of this first part.



Figure-3: Official welcome of the first meeting of the WIO N.O.I.S.E. network from left to right, Honourable Jagdish Dharamchand KOONJUL (G.C.S.K, G.O.S.K), Dr Florence GALLETTI (IRD, Law), Dr Rezah BADAL (Director General of the Department for Continental Shelf, Maritime Zones Administration and Exploration CSMZAE) and Dr Francis MARSAC (IRD, Oceanography, Ecology)
Credit: (CSMZAE courtesy)



Figure-4: Closing session at CSMZAE, by Dr F. GALLETTI, Dr F. MARSAC and Dr R. BADAL
Credit: JF Ternon, IRD

The second part of the workshop on the third day was hosted at the UOM, by Pr Ranjeet BHAGOOLI and Dr Deepeeka KAULLISING. Forty students and scientists, specialized in marine science, economics, coastal law and law of the sea (Figure-5) attended the presentations and shared their experiences of sea cruises and research projects, in the context of future management and conservation issues faced by policy makers, and as an introduction to science-to-policy dialogue.



Figure-5: Meeting with the students at the University of Mauritius
Credit: Courtesy of Dr. Sundry RAMAH

[Report Courtesy: Jean-François TERNON and GALLETTI Florence, French National Research Institute for Sustainable Development, France; E-mail: jean-francois.ternon@ird.fr and florence.galletti@ird.fr]

Tropical cyclone Yaas vis-a-vis fish mass mortality and jellyfish beach stranding

The Bay of Bengal (BoB) is known as a brewery of frequent tropical cyclones. Among the formed tropical cyclones in BoB, most of the cyclones have made landfall near the coastal areas of northwestern BoB. Odisha is a coastal state located along the east coast of India and has been a major hotspot for the landfall of tropical cyclones. Cyclones exert a significant impact on the coastal water quality. In the recent past (23 to 28 May 2021), a very severe cyclonic storm, “Yaas” was formed in the BoB, which made landfall near the northern Odisha coast with a peak intensity on May 26, 2021. Prior to the landfall of cyclone Yaas, events of fish mass mortality and jellyfish beach stranding were observed in the vicinity (Puri, ~ 200 km) of the landfall location. A team of oceanographers from INCOIS, IIT Bombay, Berhampur University, and CUTM-Bhubaneswar took instead the initiative to understand and provide a possible scientific basis for these events, using satellite remote sensing and inputs from ocean models. They analyzed the daily climatology and anomaly of Sea Surface Temperature (SST) and the daily average of phytoplankton biomass (proxy: chlorophyll-a) from satellite data and calculated the current speed and the direction using the inputs from the Hybrid Coordinate Ocean Model (HYCOM).

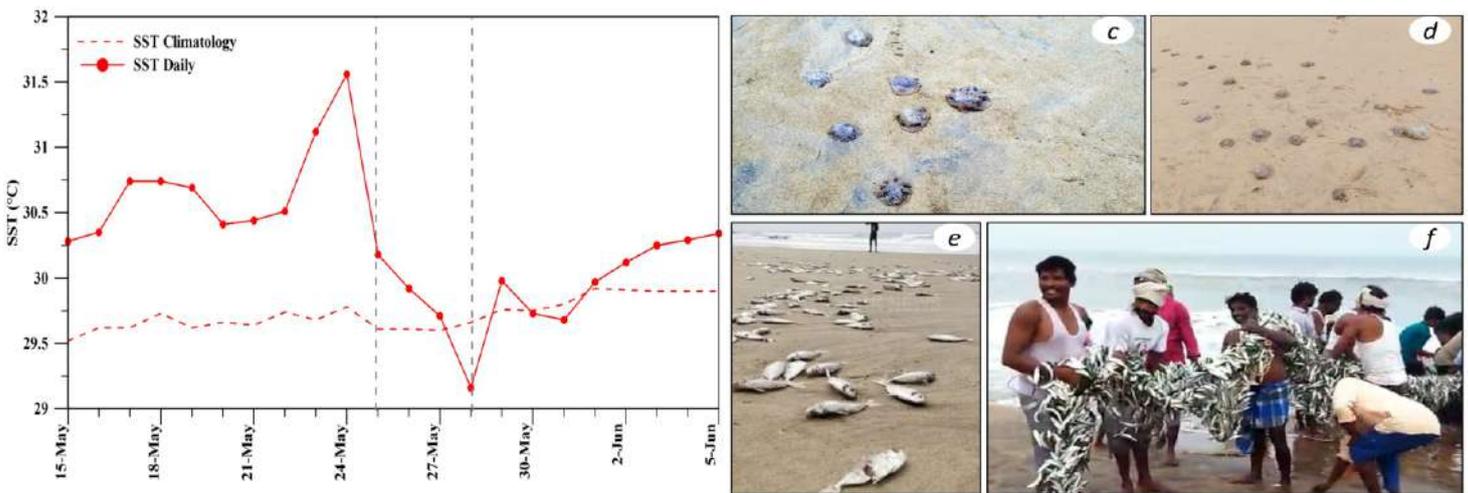


Figure-1: The upper left panel shows the variability of Sea Surface Temperature (SST) in the coastal waters of Puri, Odisha the middle right panel shows dead jellyfish washed away on the sea beach, and the lower right panel shows dead rainbow sardines washed away on the sea beach. (Image reprinted with permission from Springer-Nature, Baliarsingh et al. 2023)

The study was carried out considering the information from news reports and local fishermen to provide a scientific explanation in relation to the environmental parameters. The jellyfish observed from the event were mainly of two types, i.e., *Crambionella* and unidentified jellyfish, and the fish species was rainbow sardine (*Dussumieria acuta*). The fish mass mortality was observed one day before the jellyfish swarming, which could be due to the rise in water temperature. In the context of jellyfish, increases in temperature support the abundance by triggering their reproduction rate. The study also revealed that the plausible reason behind the swarming of jellyfish also could be related to the occurrence of rainbow sardines, as jellyfish feed on sardine larvae. The resultant jellyfish swarms were washed away towards the beach by shoreward currents and ended up with beach stranding.

Citation: Baliarsingh, S. K., Jena, A. K., Srichandan, S., Raulo, S., Joseph, S., Balakrishnan Nair, T. M., & Barik, K. K. (2023). A scientific basis for fish mass mortality and jellyfish beach stranding in relation to cyclone Yaas. *Journal of Coastal Conservation*, 27(2), 15.

[Report Courtesy: Susmita Raulo and Sanjiba K. Baliarsingh, INCOIS, Hyderabad, India; E-mail: s.raulo-p@incois.gov.in and baliarsingh.s@incois.gov.in]

Tropical Cyclone Genesis Potential Index for Bay of Bengal during Peak Post-Monsoon (October- November) Season including Atmosphere-Ocean Parameters

For the north Indian Ocean, Kotal et.al (2009) developed a Genesis Potential Index (GPI) which is used by India Meteorology Department (IMD), New Delhi. Sadhuram and Maneesha (2016) showed a close relationship between the southwest monsoon rainfall (June-September) over the subdivisions Marathwada & Telangana (sub division nos.25&29) and Total Number of Depressions Cyclones (TNDC) over Bay of Bengal during post-monsoon season. Recently, Zhang et.al (2016) examined the genesis potential indices developed by various researchers and finally proposed a GPI for north western Pacific Ocean including ocean and atmosphere parameters. Our study, we have compared the GPI (Kotal et.al, 2009; Zhang et.al, 2016) and suggested a new GPI including Upper Ocean Heat Content (UOHC) for Bay of Bengal during post-monsoon (October-November) season using the data for the period, 1995-2015. The correlations have been computed between GPI and the total number of depressions, cyclones and severe cyclones TNDC over Bay of Bengal during post-monsoon season. Genesis locations and the frequency of TNDC over Bay of Bengal are shown in Figure-1. Based on this analysis, a new GPI including UOHC has been suggested.

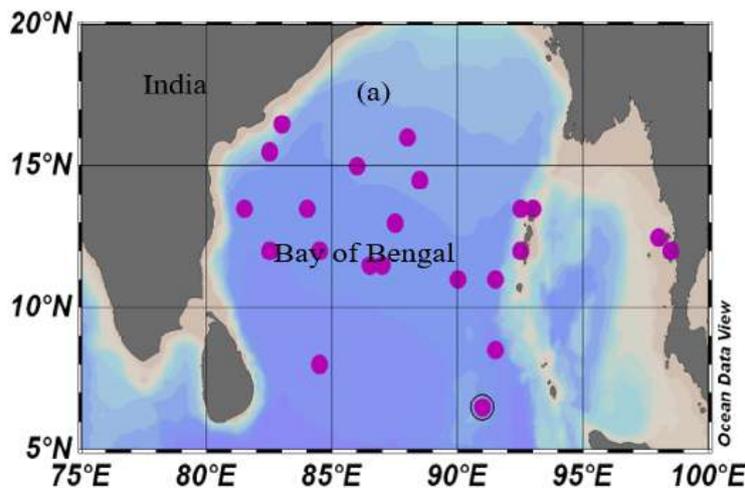


Figure-1: Genesis locations of depressions and cyclones over Bay of Bengal during peak Post- monsoon season (October-November) for the period 1995–2015

The relationship between GPI (1-4) and TNDC has been examined using correlation analysis for the period, 1995-2015. From the Figure-2, it could be clearly seen that the GPI-4 is closely linked to TNDC and the correlation coefficient is found to be 0.72 which is statistically significant at > 99% level. GPI-4 proposed here showed enhanced correlation of 0.86 (significant at > 99% level) by using the first differences [year(0)-year(-1)] of the data (GPI-4 & TNDC) which is normally used to avoid trends in the data (Nicholls, 1984). This technique has been used in our earlier studies (Sadhuram, 2016; Sadhuram and Maneesha , 2016) . The correlation between GPI -1 and TNDC is found to be 0.68. GPI-3&4 which are developed for the north western Pacific ocean (Zhang et.al, 2016) showed less correlation ($r= 0.57$, for both) than GPI-1 & 4, which is quite obvious. From this it is inferred that GPI-4 may be more suitable for Bay of Bengal during post-monsoon season which includes both atmosphere (relative vorticity, relative humidity, thermal instability and vertical wind shear) and ocean parameter (UOHC).

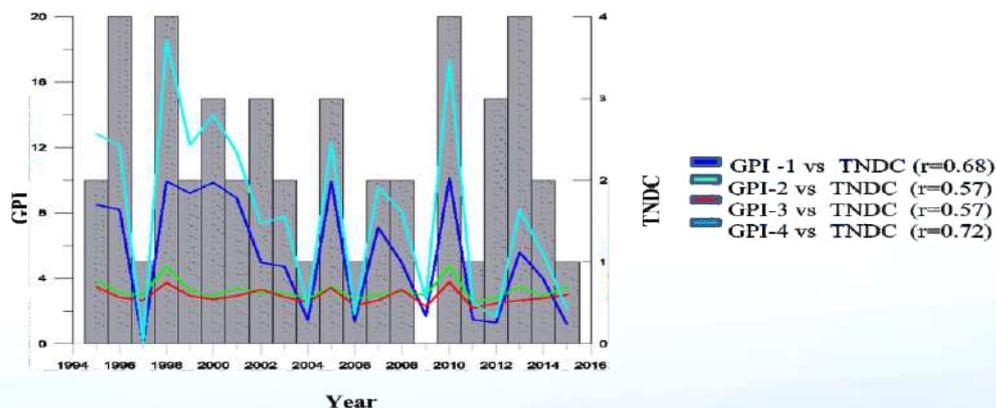


Figure-2: Inter-annual variability of GPI (1-4) along with TNDC (showing bars) over Bay of Bengal during Post monsoon season. All the correlations are significant at 99% level.

Citation: P. Suneeta & Y. Sadhuram (2018) Tropical Cyclone Genesis Potential Index for Bay of Bengal During Peak Post-Monsoon (October-November) Season Including Atmosphere- Ocean Parameters, Marine Geodesy, 41:1, 86-97

<https://doi.org/10.1080/01490419.2017.1394404>

[Report Courtesy: Ponnaganti Suneeta, INCOIS, Hyderabad, India; E-mail: s.ponnaganti-p@incois.gov.in]

Ocean Insights – Indian Ocean Seminar Series feat. ECRs

The IIOE-2 Early Career Scientist Network are thrilled to invite you to “Ocean Insights – Indian Ocean Seminar Series feat. ECRs”, a seminar series designed specifically for early career scientists in the field of marine sciences focusing on the Indian Ocean. This series aims to provide a platform for emerging researchers to showcase their work, foster connections, and explore collaborations within the marine sciences community.

Whether you are an early career researcher looking to share your work, an experienced scientist, or simply an enthusiast seeking to broaden your knowledge of marine science in the Indian Ocean, we invite you to all join us.

Each seminar will feature an engaging presentation from an early career marine scientist, followed by an interactive Q&A session, enabling participants to delve deeper into the research topics and explore novel ideas.



Details on the first talk are given below:

Key Details:

Title: Ocean Insights – Indian Ocean Seminar Series feat. ECRs

Region: Indian Ocean

Format: Online

Link: <https://zoom.us/j/91338412868?pwd=d0phMzF2YWdaOGFiWmdHSWgyOURDQT09>

Date: Every first Friday of the month, starting on **July 7th 2023**

Time: 10:30-11:30 SAST
14:00-15:00 IST
16:30-17:30 AWST

We look forward to your participation in this exciting Seminar Series.

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

Eighth National Conference of Ocean Society of India (OSICON-23) during August 23- 25, 2023, Hyderabad, India

The 8th edition of the Biennial National Conference of the Ocean Society of India (OSICON-23), scheduled to be held at INCOIS, Hyderabad, India from August 23 - 25, 2023.

The conference website may be accessed here: <https://osicon23.incois.gov.in/>

The focal theme for OSICON-23 is 'Operational Oceanography - Science to Services,' which is a critical topic for the oceanographic community. It focuses on the translation of scientific knowledge into practical applications. The conference aims to bring together experts and researchers from around the world to discuss the latest advancements in operational oceanography, share knowledge, and promote collaboration among the ocean community.



Focal Theme
Operational Oceanography - Science to Services

OSICON-23 is expected to be attended by around 350 researchers from all over India to review and discuss the recent advances in Operational Oceanography and will help scientists and students involved in ocean-atmosphere studies to benefit from interactions with the experts in the following various sub themes:

Sub Themes

1. Ocean Information and Advisory Services
2. Ocean Observations (In-situ & Satellite)
3. Ocean Modelling and Data Assimilation
4. Coastal and Open Ocean Processes
5. Air-sea Interactions
6. Biogeochemistry of the Ocean
7. Biodiversity and Ecology
8. Ocean and Climate Change
9. Ocean Engineering and Technology
10. Marine Geology and Geophysics
11. Polar Science and Cryosphere Studies
12. Blue Economy
13. Marine Resource Management
14. IMS Special Session on Importance of Ocean Observations to Monsoon Weather and Climate Forecasting

Important Dates

Notification of Acceptance of Abstract: **June 30, 2023**

Online Registration Starts: **July 01, 2023**

Last date for Online Registration of accepted abstracts: **July 15, 2023**

Last date for Online Registration of other participants: **July 31, 2023**

OSI encourages the active participation of research students in large numbers and will try to support the travel expenses of some limited deserving students.

Contact Details

Mr. E. Pattabhi Rama Rao
INCOIS
Convener

Dr. P. G. Remya
INCOIS
Co-Convener

Prof. P. Sreenivas
Univ. of Hyderabad
Co-Convener

E-mail: osicon23@incois.gov.in
Website: <https://osicon23.incois.gov.in/>



ICES - PICES 7th International Zooplankton Production Symposium during Autumn 17-22 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.

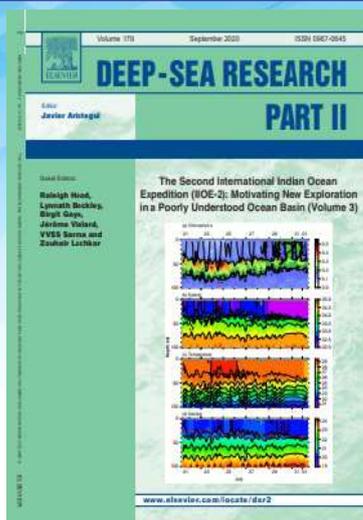
An **industry day** is also planned for Thursday 26 October and this is an important component of the program so we are looking forward to strong support from lobster and crab industry participants around the world. We are also keen to attract papers on **lobster and crab aquaculture** as this has been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

Authors notified of abstract acceptance on **12 July 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 June 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 June, 2023 is available at:

<https://mailchi.mp/clivar.org/april-2023-bulletin-17057160?e=526ed2c9ae>

Call for Contributions

Informal articles/short notes of general interest to the IIOE-2 community are invited for the next (July-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 July, 2023**



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