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

Newsletter

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

Volume-6, Issue-10
October, 2022

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.

Monaco Explorations' "Indian Ocean Expedition"

Monaco Explorations "Indian Ocean Expedition" illustrates the commitment of HSH Prince Albert II of Monaco and His Government to the international community for the protection and sustainable management of the Ocean. This is the first element of the "Monaco Explorations" project endorsed by the United Nations Decade of Ocean Sciences for Sustainable Development 2021-2030. The Expedition is taking place from 1st October to 30 November 2022 between Reunion, Mauritius and Seychelles, onboard the South African oceanographic and supply ship S.A. Agulhas II. It involves more than 150 participants, from about 20 different nationalities, including scientists, young researchers and students from an onboard school, filmmakers and photographers, divers, artists, communicators and the vessel crew.

Four stopovers from Mauritius to Reunion, Mahe (Seychelles) and back to Mauritius, a journey of approximately 7,300 nautical miles (13,500 km) and two months of navigation dedicated to the various research and field operations. The activities will take place underway, around the Aldabra Atoll (Seychelles), on the Saya de Malha Bank, where 15 days of investigations are planned, and finally around the island of Saint Brandon (Mauritius).

Guided by an Advisory Committee of fourteen international experts, the Expedition is implementing a holistic approach based on a multidisciplinary programme including natural and social sciences.

The scientific programme carried out by international teams is structured around the study of two well-identified marine areas: the Saya de Malha Bank and a selection of features located along the Expedition route. The programme is guided by the four main themes of Monaco Explorations: coral protection, megafauna protection, marine protected areas and new exploration techniques. It aims to respond to the needs of the governments of Seychelles and Mauritius as a priority, while also ensuring coordination with the relevant international and regional bodies and initiatives such as the Second International Indian Ocean Expedition [https://iioe-2.incois.gov.in/IIOE-2/EP49.jsp].

S.A. Agulhas deploying scientific teams on Aldabra Atoll (Seychelles)
© Filip Kulisev - Amazing Planet / Monaco Explorations

S.A. Agulhas II deploying a CTD along the route from Reunion to Aldabra
© Filip Kulisev - Amazing Planet / Monaco Explorations

The Expedition's purpose is also to promote the contents, knowledge and resources resulting from this operation, by encouraging the exchange and transmission of knowledge to as wide an audience as possible, through a varied outreach programme. Its various components are aimed at a broad public: schools, civil society, and decision-makers. The Expedition is expected to benefit from extensive media coverage and should result in the production of a documentary film for international distribution and other educational and artistic contents.

In terms of diplomacy, the Expedition is coordinated with an official visit to the region by HSH Prince Albert II of Monaco from 24 to 26 October 2022. Other official activities of the Sovereign Prince in relation to the objectives of the Expedition, in particular His interventions in various forums dealing with the protection of the Ocean, will broaden the political dimension of the Expedition. Policy makers in the region can rely on His singular attachment to knowledge and protection of the marine environment to relay the voice of these countries and the scientific community, but also to mobilise the international community in order to elicit and promote solutions to reduce environmental degradation.

[Report Courtesy: Gilles Bessero, Monaco Explorations Chief Operation Officer, Expedition Leader, Monaco; E-mail: gilgbessero@monacoexplorations.org]

Challenges towards sustaining the blue carbon stock in the Indian Ocean periphery

In the present context of climate change mitigation, the significance of blue carbon is unequivocally accepted by global researchers. Additionally, the global blue carbon stock supports the livelihood of a huge number of marginalized coastal communities. However, this blue carbon stock is facing a constant threat from different natural phenomena and anthropogenic activities. To unravel the present scenario of threats to blue carbon stocks along the countries boarding the Indian Ocean, a researcher from Jadavpur University meticulously studied and reported the loss of different blue carbon stocks in the Indian Ocean countries within the last couple of decades and the factors aggravating this loss. It is reported that mangroves are most vulnerable to anthropogenic activities like land-use transformation for agriculture activities, aquaculture, tourism, and other developments. In addition to this, natural threats like coastal erosion and sea level rise are also reported to have a significant impact. Likewise, seagrass is facing the constant threat of coastal water pollution, sediment deposition-induced turbidity and inorganic nutrient enhancement, and indiscriminate fishing activities along the coastal waters of all the countries. Unlike mangroves and seagrass however, salt marshes appear less vulnerable as of now which opens up a future arena for more research.

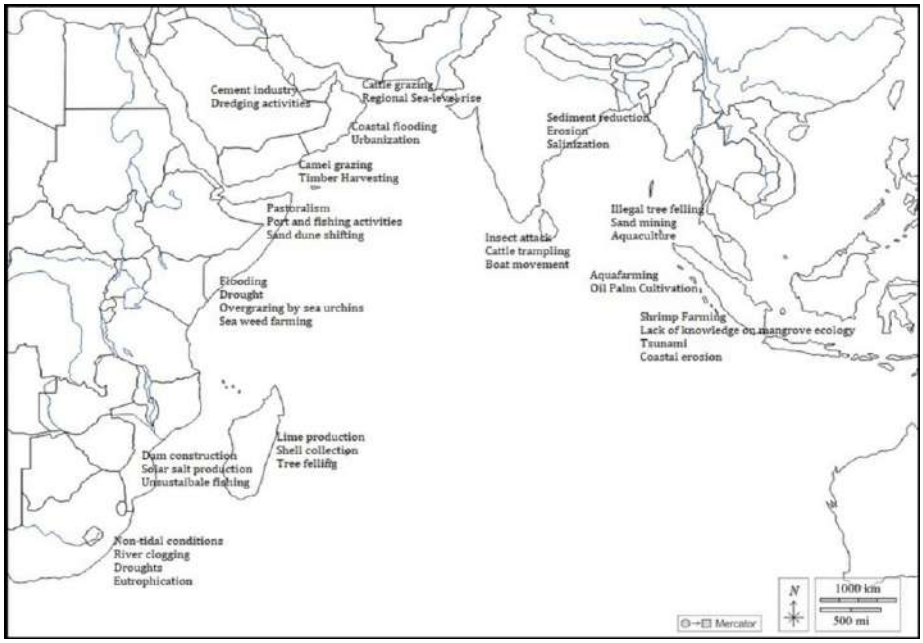

Figure: Major threats to the blue carbon ecosystems in the periphery of the Indian Ocean

Citation: Chanda, A. (2022). Threats to the Blue Carbon Ecosystems Adjoining the Indian Ocean. In: Chanda, A., Das, S., Ghosh, T. (eds) Blue Carbon Dynamics of the Indian Ocean. Springer, Cham, pp. 255-303.

https://doi.org/10.1007/978-3-030-96558-7_9

[Report Courtesy: Dr. Abhra Chanda and Dr. Sandip Giri, School of Oceanographic Studies, Jadavpur University, Kolkata, India; E-mail: abhrachanda1985@gmail.com & sandip1989ju@gmail.com]

Migration pattern of juvenile Hilsa (Tenualosa ilisha) in the Hooghly River estuary

Hilsa (Tenualosa ilisha) constitutes the most important commercial fishery in the Hooghly estuary. Being an anadromous fish species, Hilsa migrates towards the Hooghly estuary and rivers from the adjoining sea for spawning. This upstream migration is strongly associated with the intensification of the southwest monsoon (June – September). After spawning, adult fishes migrate back to the sea leaving behind the offspring in the rivers and the upper stretch of the Hooghly River estuary. The juveniles remain there for the next few months and then start migrating downwards after attaining a size of around 8-10 cm. However, this downstream migration is a matter of interest to the fisheries biologist as it is not yet understood so far. With this objective, a group of researchers from Jadavpur University, and the Indian National Centre for Ocean Information Services (INCOIS) started investigating the role of tide and lunar phases on the migration pattern

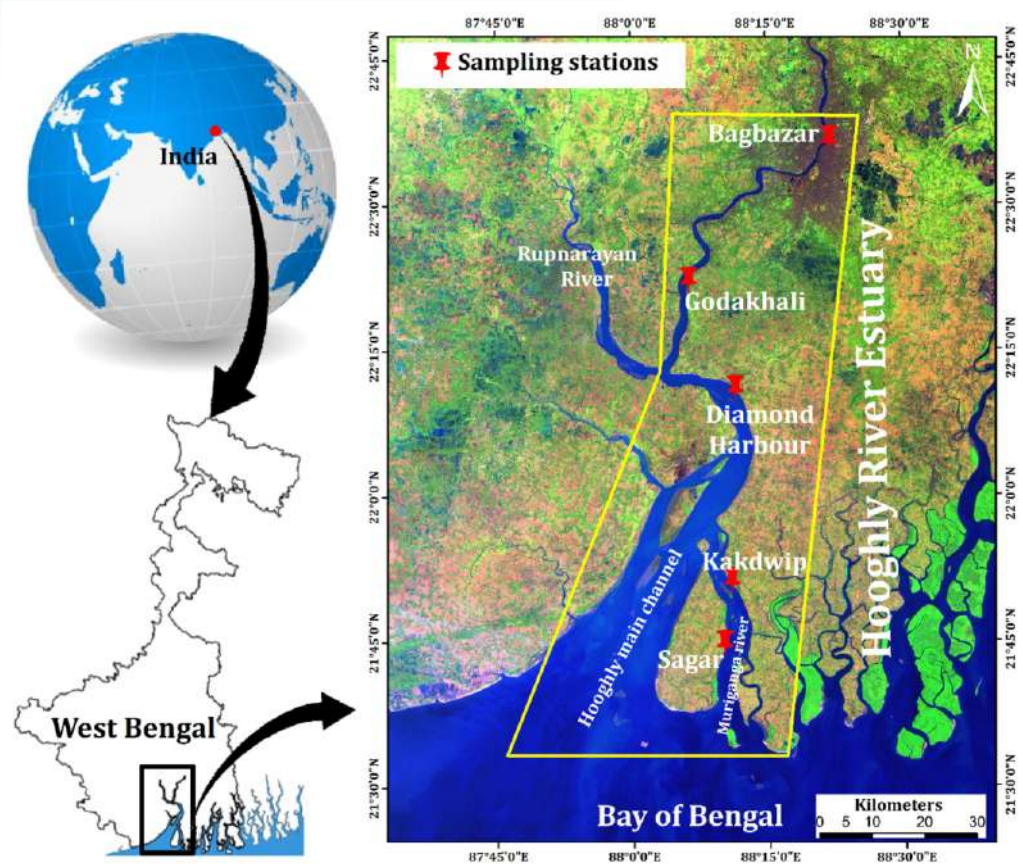

Figure: Yellow box showing the selected area of Hooghly River estuary for the study (Image reprinted by the permission from John Wiley and Sons, Journal of Fish Biology, Giri et al., 2022).

of juvenile Hilsa, as it has long been established that environmental cues often regulate the migration behavior of the fishes. Their research showed that migration behaviour is strongly influenced by tidal velocities (both high tide and low tide). However, the higher current velocity and prolonged duration of low tide facilitate the downward migration of the juveniles. As the tide velocities are further enhanced during spring tides (new moon and full moon conditions), these lunar phases are also found to play a significant role in the seaward migration of the fish. From this observation, the research team proposed a probable mechanism for the seaward migration of the juvenile Hilsa. The Team has suggested that due to the higher current velocity and prolonged duration of the low tide, the distance travelled by the juveniles towards the sea under such conditions always becomes higher than the distance travelled upward during subsequent high tide. So, after each tidal cycle, there is a net movement towards the sea. Through this process, juveniles can reach the lower stretch of estuary and sea after several consecutive tidal cycles.

Citation: Giri, S., Chanda, A., Maity, S., Chakraborty, K., & Hazra, S. (2022). Role of tide and lunar phases on the migration pattern of juvenile Hilsa shad (Tenualosa ilisha) within a meso-macrotidal estuary. Journal of Fish Biology, 100(4), 988-996.]

https://doi.org/10.1111/jfb.15003

[Report Courtesy: Dr. Sandip Giri, School of Oceanographic Studies, Jadavpur University, Kolkata, India; E-mail: sandip1989ju@gmail.com]

Indian Ocean Region Panel - call for new members

We have an open call for new members to the CLIVAR/IOC-GOOS Indian Ocean Region Panel (IORP).

IORP provides scientific and technical oversight for implementation of the sustained ocean observing system for the Indian Ocean and coordinates research on the role of the Indian Ocean on the climate system. We are looking for new panel members who can help maintain balance of expertise and diversity within the panel.

Read about IORP and its activities here:

https://www.clivar.org/clivar-panels/indian

Nominations for new members can be submitted here:

https://clivar.org/news/2022-open-call-new-members-clivar-panels-and-ssg

Self-nominations are welcome.

Submissions are now open for 15th PORSEC, in Malaysia (December, 2022)

3 - 6 December 2022 Tutorial Capacity Building

7 - 8 December 2022 Conference Date

09:00 - 17:00 (GMT+8) Time

Johor Bahru, Malaysia & Online Venue

Welcome to the 15th Pan Ocean Remote Sensing Conference (PORSEC). We hope to continue providing an opportunity for the scientists working on various aspects of ocean and atmosphere using remote sensing technology to come together, share and discuss the results and innovations, and provide training for the next generation of scientists.

In conjunction with the PORSEC 2022 conference, the 9th PORSEC Capacity Building Tutorial will be held prior to the PORSEC 2022 conference. The days tutorial offers expert training for students, and young scientists. Participants will be given theoretical lessons and practical exercises on remote sensing techniques used for monitoring the ocean-atmosphere system for research and operations.

We also would like to invite you to submit full academic papers or abstracts to the conference, related to the following themes below (but not limited to) to be addressed in the conference:

- Large and meso-scale oceanography
- Coastal impacts
- Emerging technologies for ocean and coastal applications
- Extreme events
- Operational remote sensing
- Ocean-Atmosphere interactions
- Remote sensing data for policy making
- Education and outreach
- Coastal disaster management
- Marine GIS
- Artificial intelligence and deep learning

Last Date for Conference and Tutorial Registration: 01 November 2022

Scholarship / Travel Grants:

Tuition fee waiver will be offered depend on the number of participants. Full/Partial travel grants might be available. Go to support funding section for more info.

The abstracts submitted to PORSEC2022 can be submitted as full paper to the PORSEC special issue of journals such as Tyler & Francis International Journal of Remote Sensing. This ensures efficient paper handling and gives opportunity to publish in such high IF journal.

Please don't miss to refer to important dates below and download our brochure for more information.

Important Dates:

01 Oct - 01 Nov 2022	Conference and Tutorial Registration
01 Oct - 01 Nov 2022	Paper Camera-Ready Deadline
03 - 06 December 2022	Tutorial Capacity Building
07 - 08 December 2022	Conference Day

We are looking forward to meet all of you in the upcoming conference.

[Report Courtesy: Dr. Nurul Hazrina Idris Chairperson, PORSEC2022 LOC., E-mail: nurulhazrina@utm.my or porsec2020@gmail.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).

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 49 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 October 2022 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 October, 2022 is available at:
https://mailchi.mp/clivar.org/clivar-october-2022-bulletin

Call for Contributions

Informal articles/short notes of general interest to the IIOE-2 community are invited for the next (November-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 November, 2022**

The Indian Ocean Bubble 2

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

Join IIOE-2 Community

Enroll yourself with IIOE-2 Community
https://iioe-2.incois.gov.in/IIOE-2/Signup.jsp

Follow us:

iioe-2.incois.gov.in

The IIOE-2 Newsletter is published online by:

INCOIS

@IIOE2

@iioe_2

Feedback? iioe-2@incois.gov.in