

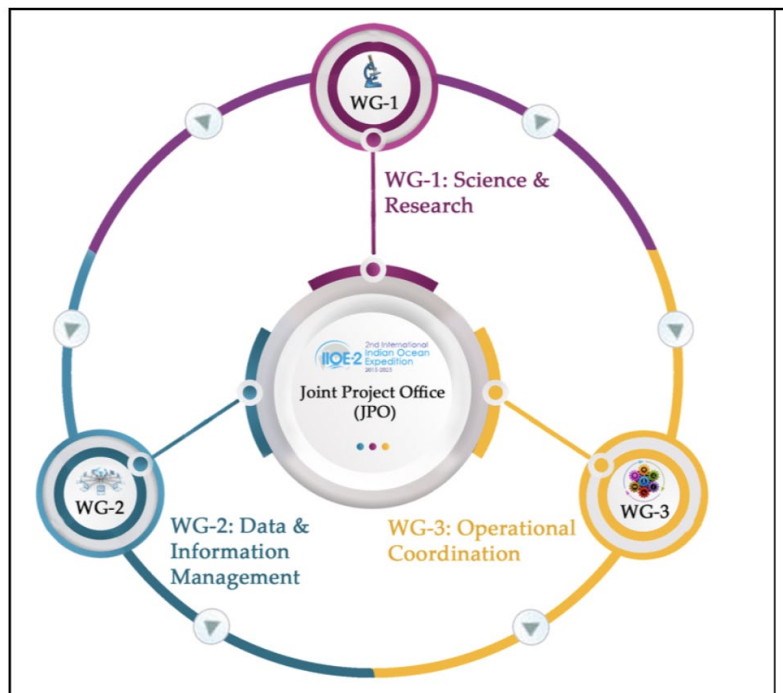


IIOE-2

2nd International
**Indian Ocean
Expedition**



Organization of IIOE-2



Role	Name	Affiliation
Co-Chair IIOE-2	Marie-Alexandrine Sicre	SCOR
	Vladimir Ryabinin	IOC
	Srinivas Kumar	IOGOOS
Co-Chair WG 1 (Science & Research)	Raleigh Hood	USA
	Hermann Bange	Germany
Co-Chairs WG 2 (Data & Information Management)	E. Pattabhi Rama Rao	India
	Harrison Ong'Anda	Kenya
Chair WG 3 (Operational Coordination)	Shailesh Nayak /Rajan Sivaramakrishnan	India
Supported by		
International Project Office (Hyderabad)	Aneesh Lotkiler	IOGOOS
SCOR Office	Emily Twigg	SCOR

The Core Group comprises:

The co-chairs who represent the sponsors and oversee IIOE-2 activities

+ 3 Working Groups co-chairs:

WG1 Science & Research

WG2 Data & Information Management

WG3 Operational Coordination)

Project Office located in Hyderabad (Aneesh Lotkiler)

Integrated meetings of IOGOOS, IORP, SIBER, IRF, IIOE-2 and IOCINDIO.

The 6th meeting of the Steering Committee of IIOE-2 **SC6** was organized in person on February 21-24, 2023 by the UWA, Australia, and IIOE-2 Project Office at the Indian National Center for Ocean Information Services (INCOIS), Hyderabad.



Outline:

- Progress
 - International Participation
 - IIOE-2 Research Initiatives (EIOURI, WIOURI, YMC, KUDOS)
- Status
 - Working Groups and Research Themes
 - Cruises/RAMA
- Products
 - EGU Special Issue of Synthesis Papers
 - IIOE-2 DSR II Special Issues on IIOE-2
 - Elsevier Book on the Indian Ocean

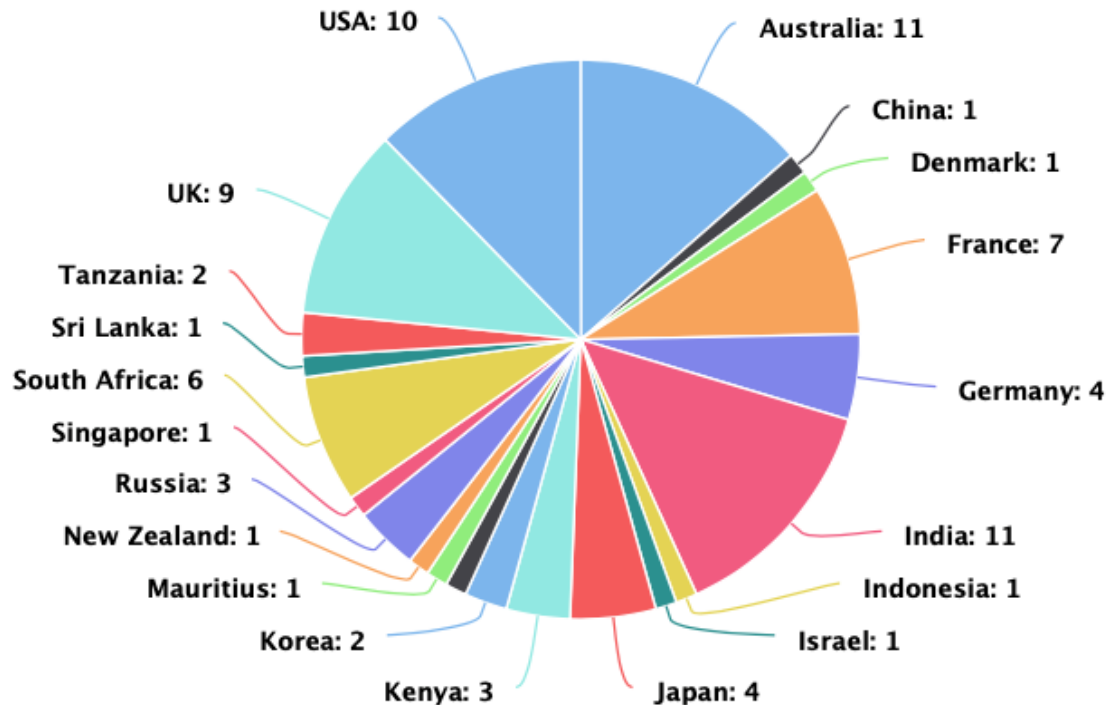
Outline:

- Progress
 - International Participation
 - IIOE-2 Research Initiatives (EIOURI, WIOURI, YMC, KUDOS)
- Status
 - Working Groups and Research Themes
 - Cruises/RAMA
- Products
 - EGU Special Issue of Synthesis Papers
 - IIOE-2 DSR II Special Issues on IIOE-2
 - Elsevier Book on the Indian Ocean



Summary of Endorsed Projects:

- 80 Endorsed projects with 20 Countries involved
- USA, India, UK, and Australia leading the way



IIOE-2 Research Initiatives:

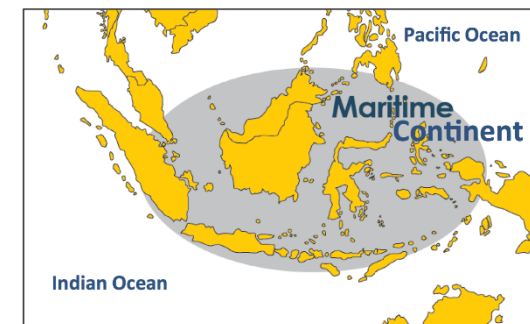
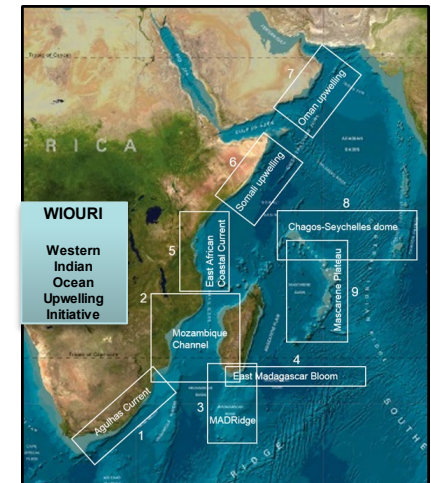
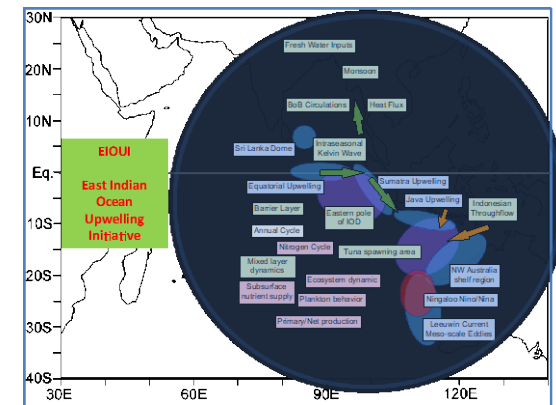
The Eastern Indian Ocean Upwelling Research Initiative:

Initiative: It is ongoing anchored by China, Japan and USA. Landry / NSF BLOOFINZ cruise recently completed. The main foci of this initiative is on the upwelling regions that develop seasonally off Java, Sumatra, and northwestern Australia. ***Efforts to revise/invigorate this initiative are underway.***

The Western Indian Ocean Upwelling Research Initiative:

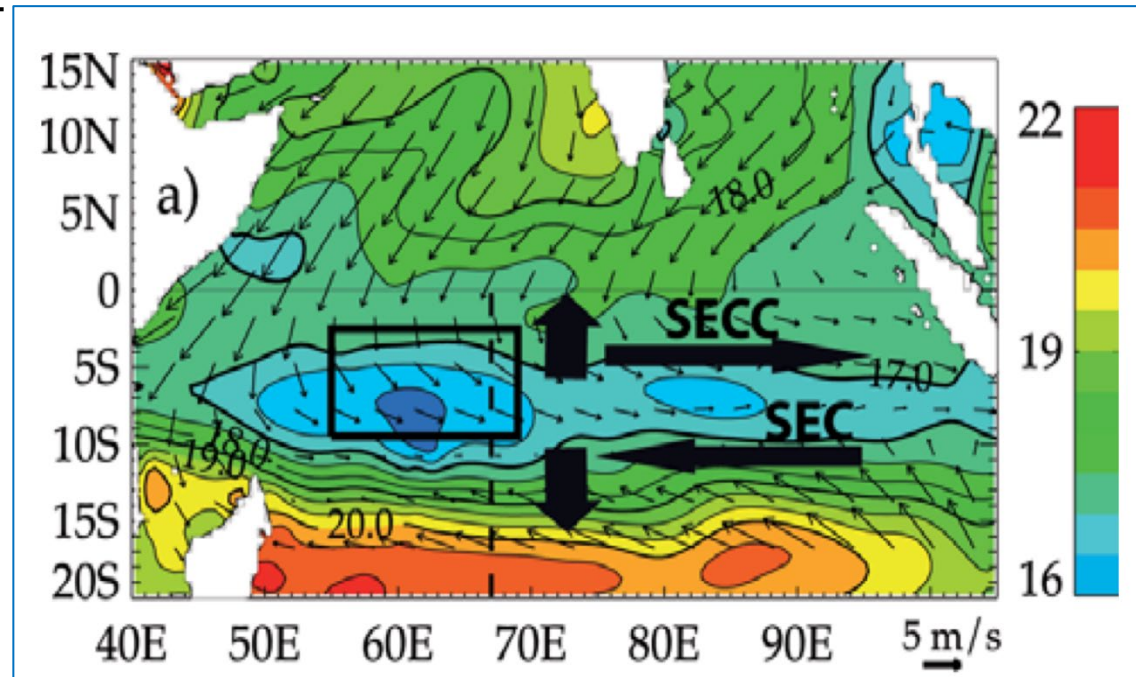
Initiative: Also ongoing. Anchored by Solstice Project and DEA Agulhas II cruises. Significant progress has been made. ***More cruises planned, e.g., upcoming Agulhas II cruises (Go-Ship IO5).***

The Years of the Maritime Continent: In addition to these research initiatives, the IIOE-2 coincided with and embraced the Years of the Maritime Continent (YMC) as a major IIOE-2 field champagne in 2017-2018. This is largely completed with ***one last cruise scheduled for 2023.***



KUDOS (Korea-US Indian Ocean Scientific Imperatives):

- Scientific focus on the Seychelles-Chagos Thermocline Ridge.
- *R. V. Isabu* cruises cancelled in 2020 and 2021, but are resuming post-COVID.
- ***Have institutionalized KUDOS cruises for the next 5 years.***
- ***Will support RAMA and other international collaborative efforts***



R. V. Isabu

KUDOS Plan available at:

<https://kiost-noaa-lab.wixsite.com/kudos2018>



Outline:

- Progress
 - International Participation
 - IIOE-2 Research Initiatives (EIOURI, WIOURI, YMC, KUDOS)
- Status
 - Working Groups and Research Themes
 - Cruises/RAMA
- Products
 - EGU Special Issue of Synthesis Papers
 - IIOE-2 DSR II Special Issues on IIOE-2
 - Elsevier Book on the Indian Ocean



Status of Research Themes:

Six Research Themes:

Theme 1: Human Impacts (Ben Milligan) **Not Active!**

Theme 2: Boundary current dynamics, upwelling variability and ecosystem impacts (P. N. Vinahachandran and Yukio Masumoto) **Active**

Theme 3: Monsoon variability and ecosystem response (Andrian Matthews and Joaquim Goes) **Active**

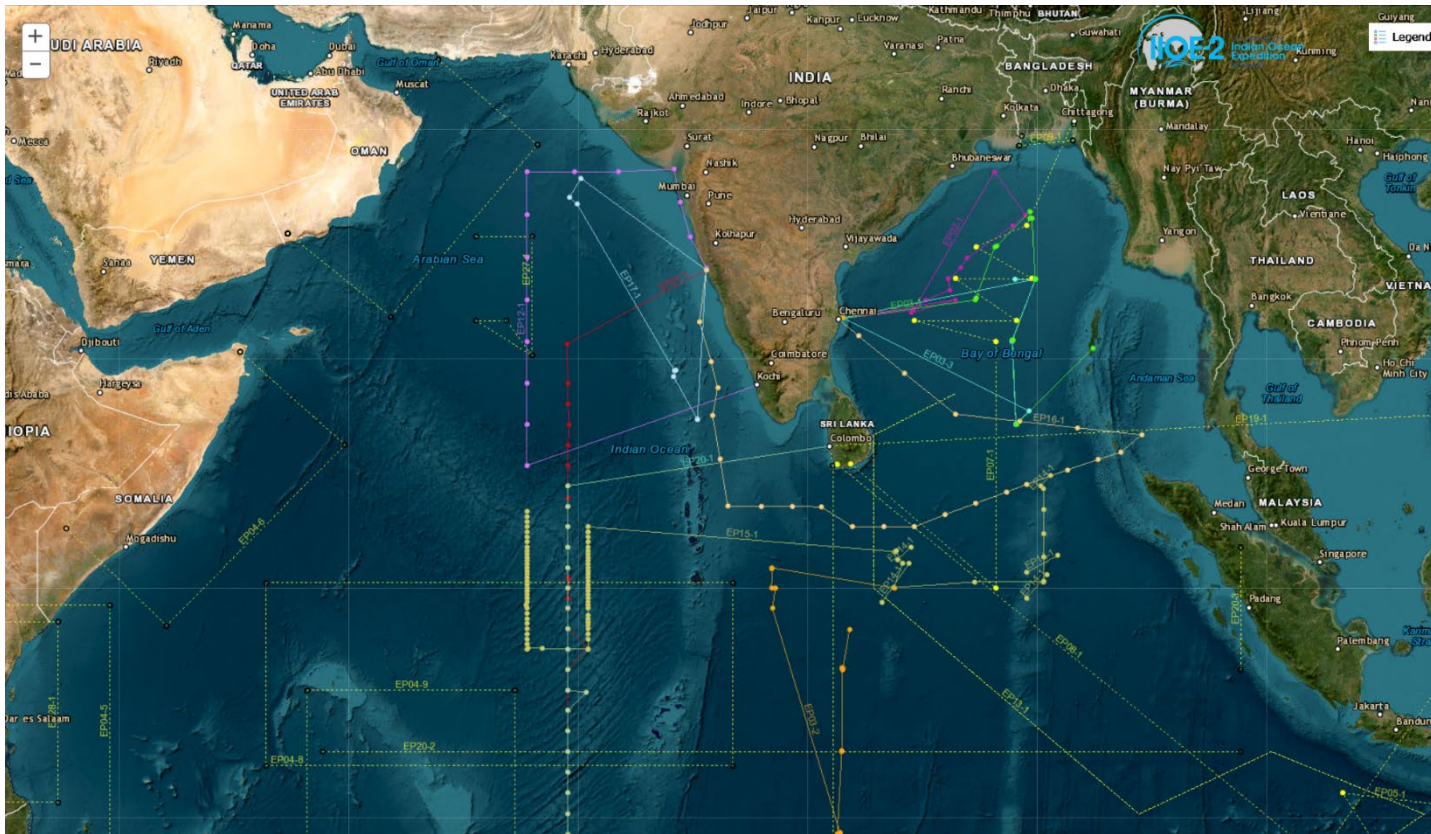
Theme 4: Circulation, climate variability and change (Amit Tandon and Helen Phillips) **Active**

Theme 5: Extreme events and their impacts on ecosystems and human populations (Chari Pattiaratchi) **Active**

Theme 6: Unique geological, physical, biogeochemical and ecological features of the Indian Ocean (Jerome Dymant) **Not Active!**

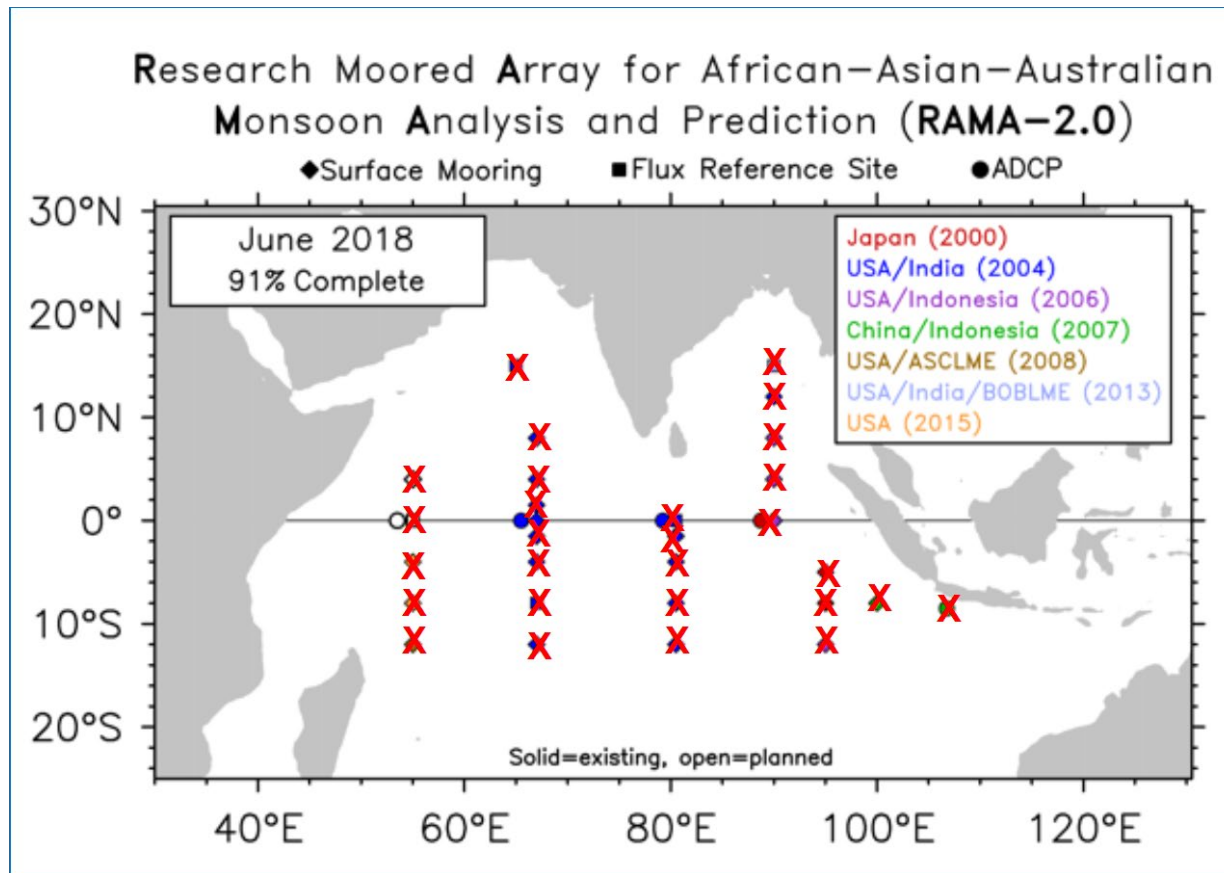
Status of Cruises:

- Cruises and research activity came to a screeching halt in Spring of 2020 due to COVID-19 pandemic.
- 18 Official IIOE-2 Cruises thus far (according to the IPO website).
- Many more if you include those not tracked by the IIOE-2 IPO.



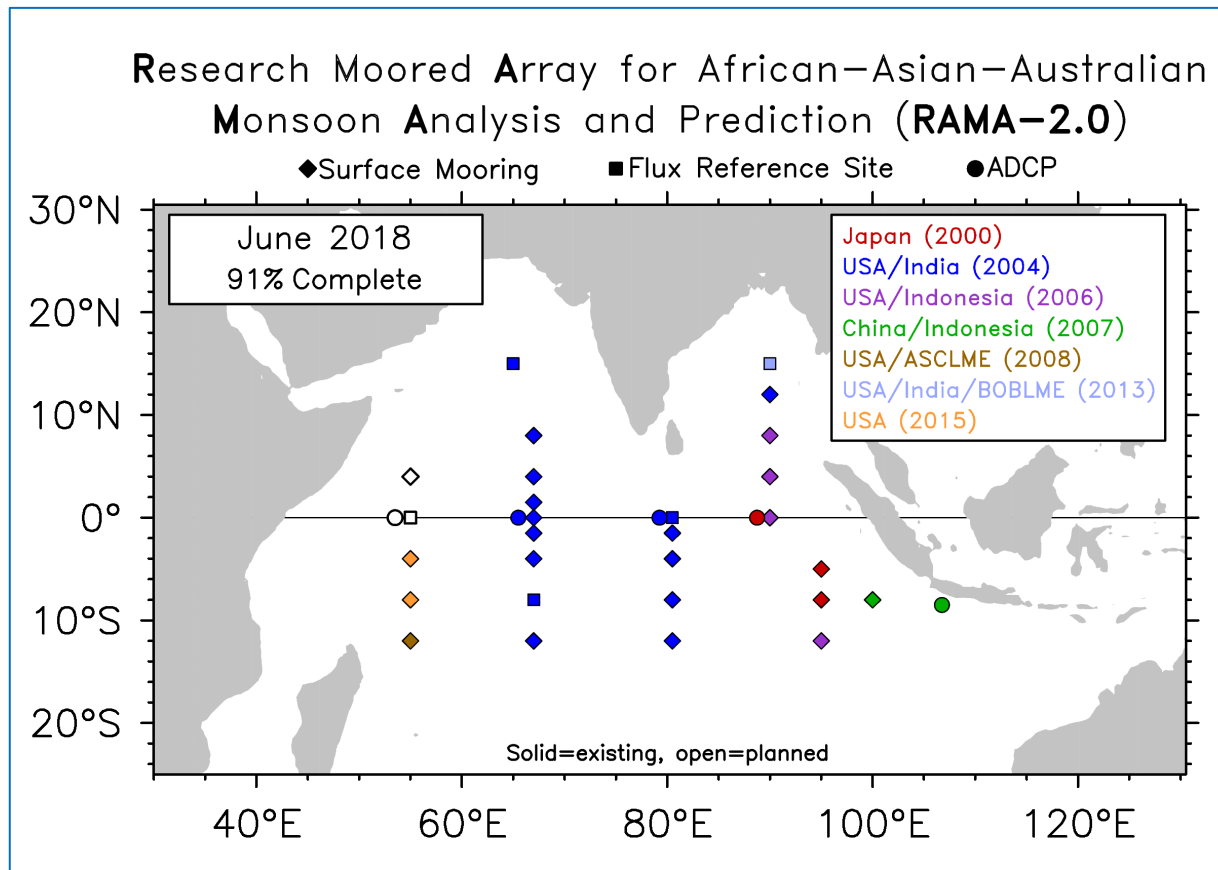
Status of Cruises/RAMA:

- COVID-19 has led to severe negative impacts on RAMA due to cancelation of mooring deployment and servicing cruises.
- ***All RAMA moorings now offline except one.***



Rapid Recovery:

- There has been a rapid resumption of cruise activity over the past 12 months.
- Anticipate bringing RAMA 70% back on line by the end of 2023!***



Outline:

- Progress
 - International Participation
 - IIOE-2 Research Initiatives (EIOURI, WIOURI, YMC, KUDOS)
- Status
 - Working Groups and Research Themes
 - Cruises/RAMA
- Products
 - EGU Special Issue of Synthesis Papers
 - IIOE-2 DSR II Special Issues on IIOE-2
 - Elsevier Book on the Indian Ocean

EGU Special Issue on IIOE-2:

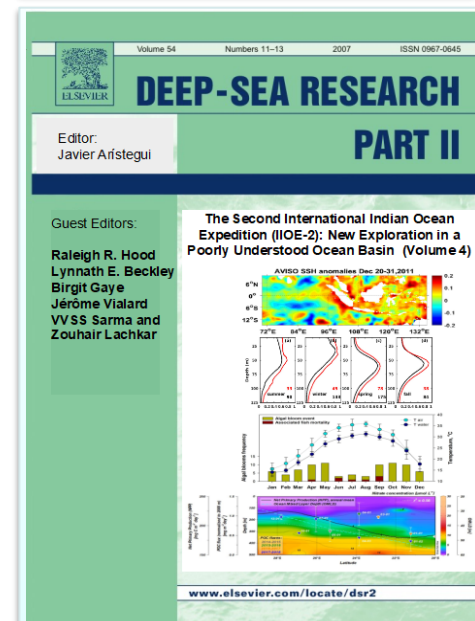
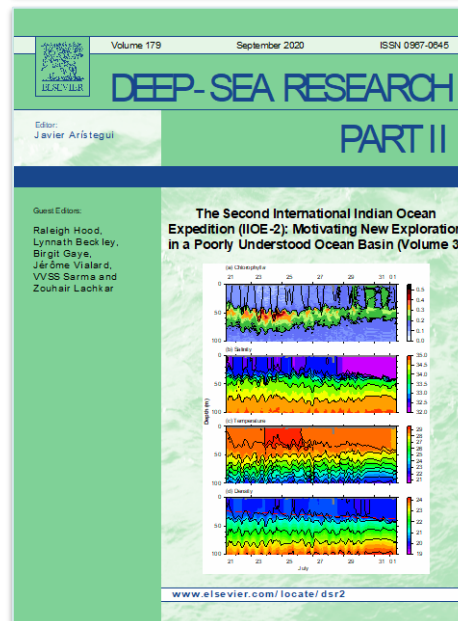
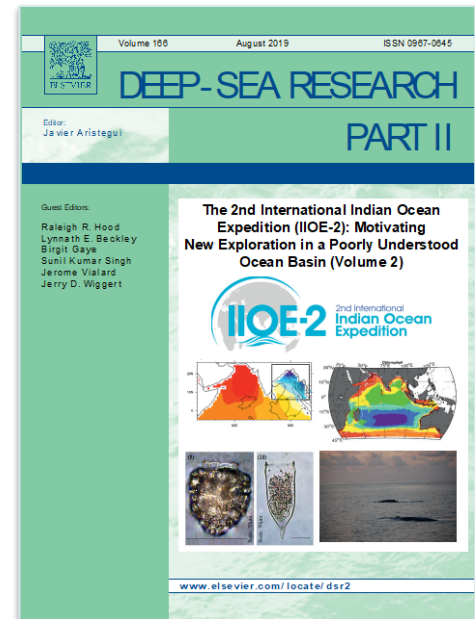
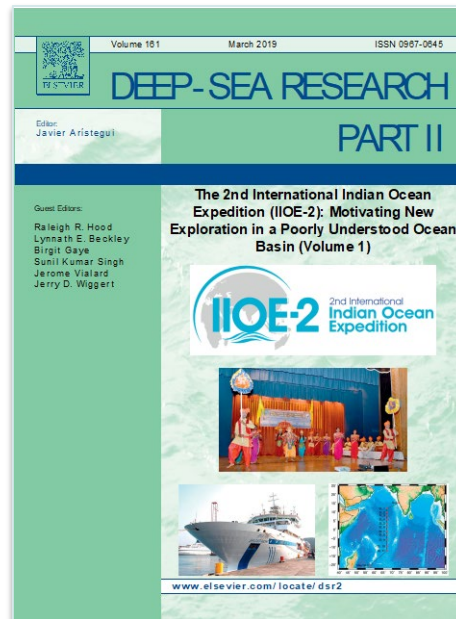
- We put together a set of synthesis papers on the Indian Ocean and published them as a special issue of EGU Journals.
- Guest editors: Raleigh Hood and Hermann Bange
- Inspired by IIOE-2 Science Plan Research Themes
- 6 synthesis papers published

bg-2020-494	Submitted on 15 Jan 2021	Reviews and syntheses
Reviews and syntheses: Trends in primary production in the Bay of Bengal – is it at a tipping point?		
Carolyn R. Löscher		
Special Issue: Understanding the Indian Ocean system: past, present and future (BG/ACP/OS/SE inter-journal SI)		
Handling Associate Editor: Viviane Menezes, vmenezes@whoi.edu		
Status: Final response (BG Discussions)		
bg-2020-492	Submitted on 14 Jan 2021	Ideas and perspectives
Ideas and perspectives: Ushering Indian Ocean into the UN Decade of Ocean Science for Sustainable Development (UNDOSD) through Marine Ecosystem Research and Operational Services – An early-career's take		
Kumar Nimit		
Special Issue: Understanding the Indian Ocean system: past, present and future (BG/ACP/OS/SE inter-journal SI)		
Handling Associate Editor: Raleigh Hood, rhood@umces.edu		
Status: Final response (BG Discussions)		
os-2020-127	Submitted on 08 Jan 2021	Review article
Plastics in the Indian Ocean – sources, fate, distribution and impacts		
Charitha Pattiaratchi, Mirjam van der Mheen, Cathleen Schlundt, Bhavani E. Narayanaswamy, Appalanaidu Sura, Sara Hajbabe, Rachel White, Nimit Kumar, Michelle Fernandes, and Sarath Wijeratne		
Special Issue: Understanding the Indian Ocean system: past, present and future (BG/ACP/OS/SE inter-journal SI)		
Handling Topic Editor: Arvind Singh, arvinds@prl.res.in		
Status: Discussion (OS Discussions)		
os-2021-1	Submitted on 04 Jan 2021	Review article
Progress in understanding of Indian Ocean circulation, variability, air-sea exchange and impacts on biogeochemistry		
Helen E. Phillips, Amit Tandon, Ryo Furue, Raleigh Hood, Caroline Ummenhofer, Jessica Benthuyzen, Viviane Menezes, Shijian Hu, Ben Webber, Alejandra Sanchez-Franks, Deepak Cherian, Emily Shroyer, Ming Feng, Hemantha Wijesekera, Abhishek Chatterjee, Lisan Yu, Juliet Hermes, Raghu Murtugudde, Tomoki Tozuka, Danielle Su, Arvind Singh, Luca Centurioni, Satya Prakash, and Jerry Wiggert		
Special Issue: Understanding the Indian Ocean system: past, present and future (BG/ACP/OS/SE inter-journal SI)		
Handling Topic Editor: Hermann Bange, hbange@geomar.de		
Status: Discussion (OS Discussions)		
bg-2020-486	Submitted on 28 Dec 2020	Reviews and syntheses
Reviews and syntheses: Physical and biogeochemical processes associated with upwelling in the Indian Ocean		
Puthenveetil Narayana Menon Vinayachandran, Yukio Masumoto, Mike Roberts, Jenny Huggett, Issuo Hale, Abhishek Chatterjee, Prakash Amol, Garuda V. M. Gupta, Arvind Singh, Arnab Mukherjee, Satya Prakash, Lynna E. Beckley, Eric Jorden Raes, and Raleigh Hood		
Special Issue: Understanding the Indian Ocean system: past, present and future (BG/ACP/OS/SE inter-journal SI)		
Handling Associate Editor: Hermann Bange, hbange@geomar.de		
Status: Final response (BG Discussions)		
acp-2020-718	Submitted on 16 Jul 2020	Review article
Atmospheric gas-phase composition over the Indian Ocean		
Susann Tegtmeyer, Christa Marandino, Yue Jia, Birgit Quack, and Anoop S. Mahajan		
Special Issue: Understanding the Indian Ocean system: past, present and future (BG/ACP/OS/SE inter-journal SI)		
Handling Editor: Rolf Müller, ro.mueller@fz-juelich.de		
Status: Discussion (ACP Discussions)		



Deep-Sea Research Special Issues on IIOE-2:

- We put together a set of special issues on IIOE-2 for publication in DSR II.
 - > *50 papers published thus far.*
- “The 2nd International Indian Ocean Expedition (IIOE-2): Motivating New Exploration in a Poorly Understood Basin”
- **Guest editor team volumes 1 and 2:**
 1. Raleigh Hood (rhood@umces.edu)
 2. Jerry Wiggert
 3. Lynnath Beckley
 4. Birgit Gaye
 5. Jerome Vialard
 6. Sunil Singh
- **Guest editor team volumes 3 and 4:**
 1. Raleigh Hood (rhood@umces.edu)
 2. Zouhair Lachkar
 3. Lynnath Beckley
 4. Birgit Gaye
 5. Jerome Vialard
 6. VVSS Sarma
- **Volume 5 is focused on the 2019 R. V. Investigator Cruise along 110° E with Guest editors:**
 1. Lynnath Beckley,
 2. Raleigh Hood
 3. Peter Thompson
- **Volume 6 now with 11 manuscripts in various stages of review, revision and production. May 15, 2023 submission deadline.**
- **Application for volume 7 will be submitted.**



Elsevier Book:

- We are putting together an interdisciplinary book of synthesis chapters on the Indian Ocean for publication as an Elsevier book.

- Editors: Caroline Ummenhofer and Raleigh Hood

- 20 chapters, with all but two submitted and in various stages of review/revision/production:

1. Raleigh Hood et al., "Introduction"
2. Timothy Walker et al., "History of the Indian Ocean"
3. Andrew Turner et al., "Monsoon variability and its drivers"
4. Helen Phillips et al., "Indian Ocean circulation"
5. Toshi Yamagata et al., "Climate phenomena of the Indian"
6. Jerome Vialard et al., "Decadal Indian Ocean variability"
7. Charlotte Demott et al., "Indian Ocean intraseasonal variability"
8. Janet Sprintall et al., "Oceanic Interbasin connections"
9. Caroline Ummenhofer et al., "Indian Ocean impact on global climate"
10. Francis Marsac et al., "Indian Ocean primary productivity & fisheries variability"
11. Raleigh Hood et al., "Nutrient, phytoplankton and zooplankton variability in the Indian Ocean"
12. Raleigh Hood et al., "Oxygen, Carbon and pH variability in the Indian Ocean"
13. Hermann Bange et al., "Air-sea exchange and its impacts on biogeochemistry in the Indian Ocean"
14. Carolin Loscher et al., "Microbiology of the Indian Ocean"
15. Faiza Al-Yamani et al., "Physical and biogeochemical characteristics of Indian Ocean marginal seas"
16. Michael McPhaden et al., "Observing the Indian Ocean"
17. Toshi Shinoda et al., "Modeling the Indian Ocean"
18. Mahyar Mohtadi et al., "Paleo evidence to understand Indian Ocean variability across a range of timescales"
19. MK Roxy et al., "Future projections for the Indian Ocean"
20. Ming Feng et al., "Extreme events & impacts"



ELSEVIER



OUTREACH: Helping INCOIS with the THE INDIAN OCEAN BUBBLE



Bi-annual informal newsletter providing short articles contributed by scientists with a sustained interest in the Indian Ocean studies. To date, 13 issues have been published, with the e-versions reaching out to nearly 1000 people.

OUTREACH



OUTREACH: The IIOE-2 monthly newsletters

e-newsletter started in March 2017 and published on the last working day of each month highlighting the various activities in IIOE-2. As on date, 50 issues of this Monthly Newsletter have been released and mailed to nearly 900 people.

IIOE-2 METADATA & DATA PORTAL

Catalog of projects, cruises, moorings, datasets ...

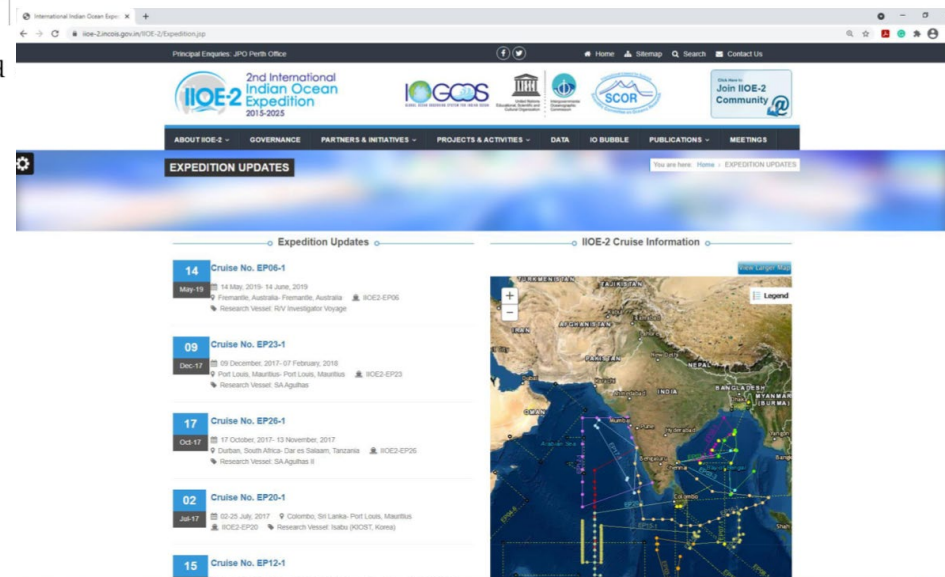
Hosted at INCOIS (Hyderabad, India)



- IIOE-2 Metadata Portal enables search and discovery of metadata of completed

IIOE-2 PORTAL

IIOE-2 EXPEDITION UPDATES



UPCOMING EVENTS

- IIOE-2 SSC will meet at INCOIS in Hyderabad, November, 28-30, 2023
On the Future Road Map for IIOE-2
- 6th International Conference on Global warming on 4 to 7 december 2023 in the context of the UNFCCC/COP28 in the UAE
- INCOS is ITCOO Category-2 Center of Unesco for CD for the IO rim (IOR), African countries bordering the Indian and Atlantic Oceans and small islands countries. Provide infos & services to various sectors e.g. fishermen, disaster management, shipping, ports, coastal states, navy, coast guard, offshore industries for conducting day-to-day operations
- INCOIS endorsed as a UN Decade Collaborative Office (UNDCO)
- New adopted IOCINDIO sub-commission (19 Member States) (resolution A-32/1) during the GA on the IOC in June 2023 in Paris on the transformation of IOCINDIO sub-committee into an IOC sub-commission (+WESPAC, IOCAfrica, IOCARIBE)
- > **Build upon IIOE-2 activities to create synergies with existing and future programmes in the central Indian Ocean**

Thank You!

