

# UDA

## UNDERWATER DOMAIN AWARENESS

### E-NEWSLETTER - 2025



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## THOUGHTS FROM THE EDITOR

*“As we come to the close of the final quarter of 2025, it offers an opportunity to reflect on a year marked by steady effort and meaningful collaborations. This quarter has once again highlighted the value of sound research, indigenous technological development, and sustained capacity-building in addressing the evolving coastal and strategic security needs. As we move forward, the progress made this year encourages us to deepen our engagements, focus on building skills and talent, and continue working on practical tools that support secure and sustainable maritime governance. We remain committed to contributing thoughtfully to international, national, and regional conversations in the underwater domain.”*



### **Nishtha Vishwakarma**

**Head of Communication and Outreach,  
Maritime Research Center**

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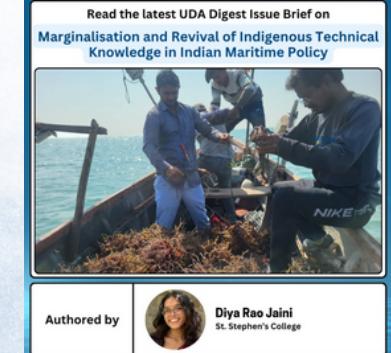
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Authored by  Diya Rao Jaini  
St. Stephen's College

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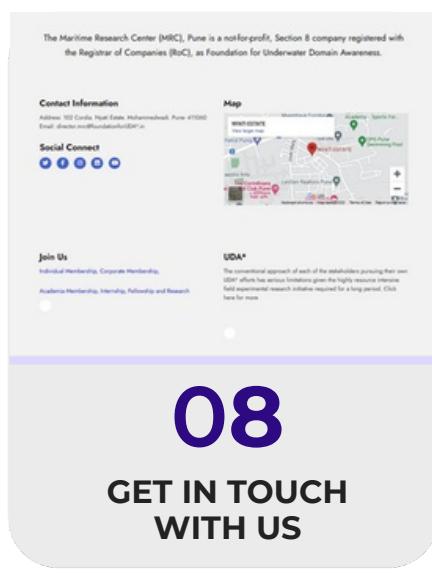
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## Key Updates and Interactions



On 13 November 2025, we signed an MoU with the National Institute of Technology (NIT), Meghalaya. It was signed in the presence of our Founder and Director, Dr (Cdr.) Arnab Das, and the Director of NIT Meghalaya, Prof. Pinakeswar Mahanta, and several industry representatives from organizations, including JSW Steel, Steel Authority of India (SAIL), NTPC Limited, Vedanta Group, etc. This collaboration marks a significant step toward advancing joint research, capacity building, and technological innovation in the underwater domain.

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On 14 October 2025, Dr (Cdr.) Arnab Das held a meeting with Mr Sudhakar Dalela, Secretary (Economic Relations), Ministry of External Affairs, Government of India (GoI), in New Delhi.

The discussion centered on exploring opportunities for strategic collaboration within the Underwater Domain Awareness (UDA) Framework, with a focus on aligning India's national maritime interests with broader regional and global initiatives.

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On 02 December 2025, Dr (Cdr.) Arnab Das called upon Dr. Ajay Kumar, Honourable Chairperson of the Union Public Service Commission (UPSC), Government of India, in New Delhi. This interaction holds great significance for us as Dr. Kumar has been a valued mentor since his distinguished tenure as Defence Secretary, Government of India, and continues to offer invaluable guidance to our mission. Their discussions focused on our cutting-edge research and initiatives under the UDA framework.

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On the sidelines of the Indo-Pacific Regional Dialogue (IPRD 2025), held in New Delhi, Dr (Cdr.) Arnab Das interacted with Admiral Karambir Singh (Retd), Former Chief of the Naval Staff and Chairman of the National Maritime Foundation.

During their interaction, they discussed the growing significance of UDA in ensuring holistic maritime security and sustainable development across the Indo-Pacific region.

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On the sidelines of the Indo-Pacific Regional Dialogue (IPRD 2025), held in New Delhi, Dr (Cdr.) Arnab Das interacted with H.E. Mr Sanjiv Ranjan, Secretary-General of the IORA Secretariat. With India set to assume the Chairship of IORA, such engagements highlight the country's pivotal role in advancing inclusive and collaborative frameworks for the Blue Economy and UDA.

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While attending the Indo-Pacific Regional Dialogue (IPRD) in New Delhi, Dr (Cdr.) Arnab Das held a meeting with the Taiwanese delegation. He interacted with Ms Julia Hsiang-Wen Huang, Deputy Minister at the Ocean Affairs Council, Taiwan. He discussed the importance of enhancing collaborative research and capacity building in the UDA Framework.

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## Key Updates and Interactions



In October 2025, Dr (Cdr.) Arnab Das visited Jawaharlal Nehru University, Delhi, where he conducted an insightful session on UDA and its growing strategic significance in the Indo-Pacific region. During the session, Dr Das highlighted the critical role of UDA in strengthening maritime security, the sustainable blue economy, and regional cooperation. He also encouraged students and researchers to explore the intersections of technology, policy, and capacity building under the UDA Framework.

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On 8 October 2025, we conducted a session on 'AI in Strategic Planning and Simulation of Naval Operations – UDA Framework' for the Indian Navy officials. This session was part of the 7th edition of the three-day Artificial Intelligence (AI) workshop, titled "Beyond the Horizon: Impact of AI on Naval Warfare." As a token of appreciation for his contribution, Dr Das received a memento from the Indian Navy for his participation and insightful session.

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On 27 October 2025, Dr (Cdr.) Arnab Das attended a closed-door meeting hosted by the Taiwan Chamber of Commerce, Mumbai, on 'Ocean Discussions.' During the interaction, Dr Das emphasized the growing importance of collaboration between India and Taiwan in advancing maritime and underwater security. The discussion brought together key stakeholders and experts to exchange ideas on enhancing regional cooperation, fostering technology-driven solutions, and supporting a resilient blue economy.

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During his participation at the closed-door meeting hosted by the Taiwan Chamber of Commerce, Mumbai, on 'Ocean Discussions,' Dr (Cdr) Arnab Das had the opportunity to interact with Mr. Micheal C. Huang, Senior Research Fellow at the Ocean Policy Research Institute, Sasakawa Peace Foundation (SPF), Japan. This interaction also builds on our ongoing engagement with the SPF over the past year, through which we have been actively collaborating to advance UDA and promote a sustainable blue economy in the region.

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We participated in the India International Symposium on Acoustics (IISA 2025), held in Gurugram from October 30 to November 2, 2025. This event was organized by the Acoustical Society of India & K-IIT CoE. Dr Das presented multiple research papers authored by our Research Fellows and Research Interns, highlighting the Centre's ongoing contributions to the field of acoustic science and UDA.

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MRC Research Fellow Ashwani Kumar Singh from IIT Kanpur participated in the India International Symposium on Acoustics (IISA 2025). During the symposium, Ashwani presented his research on "Modelling and Simulation Framework to Analyse the Effects of Anthropogenic Activities on the Ecology of the Konkan Coast." His paper was among the six papers that MRC presented at the symposium, which were developed and contributed by UDA Summer Interns from the 2025 batch.

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## Key Updates and Interactions



Dr (Cdr.) Arnab Das participated as the Guest of Honour at the 'Industry, Academia and Research Conclave 2025,' hosted by the National Institute of Technology (NIT), Meghalaya, on 13–14 November 2025. The conclave, themed "Catalyzing Change for a Sustainable Future," witnessed active participation from students, industry experts, academia, researchers, and professionals across diverse domains. He also chaired an Oral Paper Presentation session for PhD scholars, contributing valuable insights to the discussions.

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On 02 December 2025, Dr (Cdr.) Arnab Das met Amb. Riva Ganguly Das, Former Secretary (East), Ministry of External Affairs, Government of India, and Director General of the Indian Council of World Affairs, in New Delhi. During the discussion, Dr Das shared MRC's initiatives in UDA, highlighting its relevance to regional diplomacy, blue economy growth, security cooperation, and sustainable development in the Indo-Pacific.

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On 03 December 2025, Dr (Cdr.) Arnab Das spoke at the Blue Economy Summit during the Geo Smart India Summit 2025 held in New Delhi. The session titled, 'Blue Economy and Hydro spatial Infrastructure: Unlocking Marine Potential through Hydro spatial Intelligence,' explored how emerging technologies are redefining the future of India's ocean landscape. The panel also featured distinguished experts who contributed valuable perspectives to the discussion.

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On the occasion of Indian Navy Day 2025, Dr (Cdr.) Arnab Das met with Vice Admiral Gurcharan Singh, AVSM, NM, currently serving as the Chief of Personnel at Naval Headquarters (NHQ). We have previously had the honour of engaging with Vice Admiral Singh during his tenure as the Commandant of the National Defence Academy (NDA). We deeply value his continued encouragement and support for our efforts.

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We have signed an MoU with the World Trade Center (Pune), reinforcing our institutional commitment to advancing multidisciplinary learning and applied research. Under this collaboration, we will design and deliver industry-aligned courses, internships, and specialized workshops through WTC Pune to nurture future-ready talent for the maritime sector. These initiatives will equip students and professionals with the knowledge and skills required to navigate the complexities of an evolving global maritime and Blue Economy landscape.

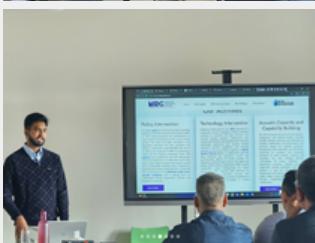
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Dr (Cdr.) Arnab Das participated in the International Conference on 'The World Ocean- A Space for Cooperation and Competitions,' hosted by the Primakov National Research Institute of World Economy and International Relations, Russian Academy of Sciences (RUSSIA), during which he was part of the speakers' panel on 'Contours of the Future.' The online session explored the role of new maritime technologies in the coming decade and the prospects for the development of AI and USVs.

## DAY 1



The MRC conducted a 3-day UDA Workshop for Government Officials from November 19-21, 2025. This workshop was conducted in collaboration with the Ministry of Environment, Forest, and Climate Change.



On Day 1 of the workshop, Dr (Cdr.) Arnab Das opened the session with a powerful session on 'UDA as an Environmental Imperative,' highlighting how underwater sensing, acoustics, and data can strengthen forest, coastal, and climate resilience planning. Our team presented on Blue Economy & Marine Spatial Planning (MSP), emphasizing integrated policy interventions that connect marine governance with land-based ecosystem management. Furthermore, our on-site team showcased the key UDA platforms hosted on our websites and walked the participants through the various digital platforms.

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## DAY 2



Day 2 of the UDA Workshop started with many insightful sessions, where the first session was on Maritime Security dimensions of UDA, contextualizing its significance for the armed forces and national strategic preparedness. The day progressed with discussions on Aquaculture and Inland Water Systems through a UDA lens, highlighting the importance of science-led interventions for sustainable livelihoods and environmental resilience. There was also a detailed presentation on Sediment and Watershed Management, Tracing Sediment Flow, and Understanding River Discharge Patterns.



A key technical highlight was the Demonstration of the Marine Spatial Planning (MSP) Tool, showcasing how data-driven MSP can support effective marine resource management.

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## DAY 3



Day 3 of the UDA Workshop for Government Officials concluded with an immersive field visit to the Bhigwan Flamingo Bird Sanctuary on the backwaters of the Ujani Dam, an internationally recognized freshwater ecosystem rich in biodiversity and local livelihoods.



Coinciding with World Fisheries Day 2025, the visit highlighted the critical link between sustainable freshwater ecosystems, fisheries-based livelihoods, and informed environmental stewardship. A cohort of 13 officers from the NDRF, BSF, ICAR, and the Fisheries Department participated in the visit, guided by renowned environmentalist Dr Erach Bharucha.

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[VIEW REPORT](#)

Read the latest UDA Digest Issue Brief on  
Hunting the Invisible: How AI and Satellite Radar  
Are Spotting India's Dark Ships



Authored by

Deepak Kumar  
IIT Kharagpur

### Hunting the Invisible: How AI and Satellite Radar Are Spotting India's Dark Ships

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Read the latest UDA Digest Issue Brief on  
Marginalisation and Revival of Indigenous Technical  
Knowledge in Indian Maritime Policy



Authored by

Diya Rao Jaini  
St. Stephen's College

### Marginalisation and Revival of Indigenous Technical Knowledge in Indian Maritime Policy

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Read the latest UDA Digest article on  
Shared Waters, Shared Futures? The  
Brahmaputra in India–China Relations



Authored by

Atul Mangal  
IIT Delhi

### Shared Waters, Shared Futures? The Brahmaputra in India–China Relations

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Read the latest UDA Digest article on  
Understanding Local Sediment Transport–  
Lessons from the Vishwamitri River Erosion



Authored by

Mehak  
Former MRC Intern, St. Stephen's  
College, University of Delhi

### Understanding Local Sediment Transport– Lessons from the Vishwamitri River Erosion

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Read the latest UDA Digest article on  
How does UDA help in Climate Change Risk  
Assessment? A case for the Indian Ocean Region (IOR)



Authored by

Akash Prasad  
IIT Bombay

### How does UDA help in Climate Change Risk Assessment? A case for the Indian Ocean Region (IOR)

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Read the latest UDA Digest article on  
Digital Transformation for Ocean Governance: The  
Role of UDA in Monitoring and Regulation



Authored by

Mahak  
St. Stephen's College, DU

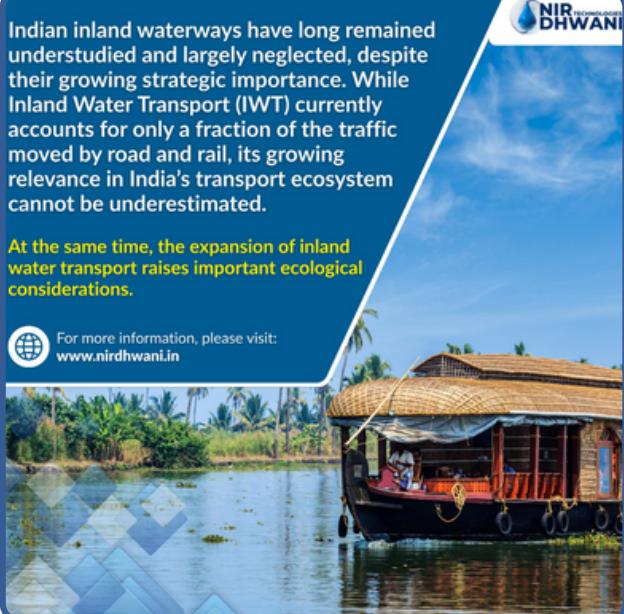
### Digital Transformation for Ocean Governance: The Role of UDA in Monitoring and Regulation

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Product features of  
**The Shipping Radiated Noise (SRN)  
Estimation Tool**

### Shipping Radiated Noise Estimation Using AI

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Indian inland waterways have long remained understudied and largely neglected, despite their growing strategic importance. While Inland Water Transport (IWT) currently accounts for only a fraction of the traffic moved by road and rail, its growing relevance in India's transport ecosystem cannot be underestimated.

At the same time, the expansion of inland water transport raises important ecological considerations.

For more information, please visit: [www.nirdhwani.in](http://www.nirdhwani.in)

### Vessel Path Prediction IWT

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**Features of the Area Production Yield (APY) Tool**

### APY Analysis for Shrimp Farming

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**What is the Area Production Yield (APY) Tool?**

### Area, Production And Yield Analysis For Shrimp And Seaweed Farming

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## Research Paper in the Souvenir Publication of the Centre for Bay of Bengal Studies, Asian Confluence

**MRC** MARITIME RESEARCH CENTER  
FOUNDATION FOR UNDERSEA AND OCEANIC AWARNESS

*“The Bay of Bengal is among the world’s most biodiverse seas, sustaining millions through fisheries, fertile deltas, and coastal ecosystems. Yet it faces mounting threats from overfishing, habitat loss, sediment mismanagement, pollution, and climate change, which intensify risks of cyclones, rising seas, and salinity intrusion.”*

*J. Cathrine and Dr (Cdr) Arnab Das, in the latest ‘Souvenir Publication of the Centre for Bay of Bengal Studies’ at the Asian Confluence*




**Dr (Cdr.) Arnab Das and Cathrine J contributed a research paper in the latest Souvenir Publication of the Centre for Bay of Bengal Studies, Asian Confluence.** The title of the research paper is **“Underwater Domain Awareness (UDA) for the Bay of Bengal Region: A Framework for Good Governance.”**

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[Full Publication](#)

## Book Chapter in the ‘Indian Coastal Alliance Compendium’ of the CPPR and The Asia Foundation

**MRC** MARITIME RESEARCH CENTER  
FOUNDATION FOR UNDERSEA AND OCEANIC AWARNESS

*“Despite its increased significance after the 9/11 and 26/11 terror attacks, Maritime Domain Awareness (MDA) remains largely surface-focused and reactive.”*

*– Dr (Cdr) Arnab Das in the ‘Indian Coastal Alliance’ Compendium on ‘Priorities and Challenges in the Indian Ocean Region’ by CPPR and The Asia Foundation.*

**Dr (Cdr) Arnab Das, Founder and Director of MRC**

DAY WORKSHOP ON

NIR DHWANI  
INDO-SWISS  
EN & TOUBRO

**Dr (Cdr.) Arnab Das contributed a book chapter in the ‘Indian Coastal Alliance Compendium’ by the Centre for Public Policy Research (CPPR) and The Asia Foundation. The compendium, “Priorities and Challenges in the Indian Coastal Region: Environmental, Economic, and Geopolitical Perspectives”, was released on 5 December 2025.**

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**UDA Insights from Mr Gopal Krishna Pilai**

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**UDA Insights by Capt. Kapil Dev Behal**

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**UDA Insights by Mr PV Krishna**

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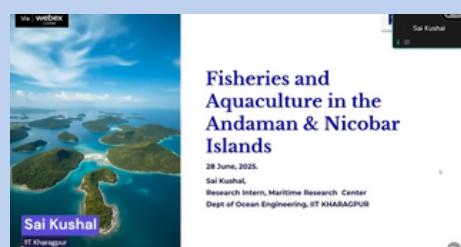
**UDA Insights on Maritime Security by Rear Admiral Monty Khanna**

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**Localised Marine Impact Dashboards (LMIDs):  
A UDA-driven approach to MSP**

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**Fisheries and Aquaculture in the Andaman and Nicobar Islands**

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**Safeguarding India's Digital Lifelines – Submarine Cables**

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**Digitalisation of the Fouling Process**

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**Meet the APY Tool**  
Developed by NirDhwani Technology, Pune

**Introducing our Shipping Radiated Noise (SRN) Tool | July 2025**

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**Introducing SRN Tool**  
A smart AI-powered platform  
Developed by NirDhwani Technologies Pvt. Ltd.

**Digital Transformation through APY Tool | Fishing and Aquaculture Sector | July 2025**

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that **commercial ships** are one of the biggest sources of underwater noise pollution?

**Shipping Radiated Noise (SRN) Management**

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**MRC MARITIME RESEARCH CENTER** **NIR DHWANI**

**The Brahmaputra River Basin (BRB) is a critical transboundary water system**

**The Brahmaputra River Basin (BRB)**

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## IMPORTANT DAYS

**NRG MARITIME RESEARCH CENTER**

**International Day for Disaster Risk Reduction**  
Strengthening Resilience to Safeguard our Oceans and Coastal Communities

**International Day for Disaster Risk Reduction: 13 Oct, 2025**

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**NRG MARITIME RESEARCH CENTER**

**NOVEMBER 5, 2025**  
**WORLD TSUNAMI AWARENESS DAY**  
Let's pledge to stay informed, prepared, and united in building safer and resilient coastal communities

**World Tsunami Awareness Day: 4 Nov, 2025**

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**WORLD FISHERIES DAY 2025**  
Sustaining Our Oceans, Securing Our Future

**World Fisheries Day: 20 Nov, 2025**

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**NRG MARITIME RESEARCH CENTER**

**4TH DEC 2025**  
**INDIAN NAVY DAY**  
SALUTING THE BRAVE HEROES WHO SAFEGUARD OUR SEAS WITH COURAGE, PRIDE, AND HONOR.

**Indian Navy Day: 4 Dec, 2025**

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**PROF. MIMI FABE**

National Police College,  
Philippines



**MS. JOAN ANDREA TOLEDO**

Indo-Pacific Alliance,  
Philippines



**SUCHIR MAMIDALA**

IIT Madras



**ASHWANI KUMAR SINGH**

IIT Kanpur



**TEJASWINI KAKTIKAR**

University College London (UCL),  
United Kingdom (UK)



**CALESTINE**

Nelson Mandela Center for  
Conflict Resolution, Jamia Millia  
Islamia, New Delhi

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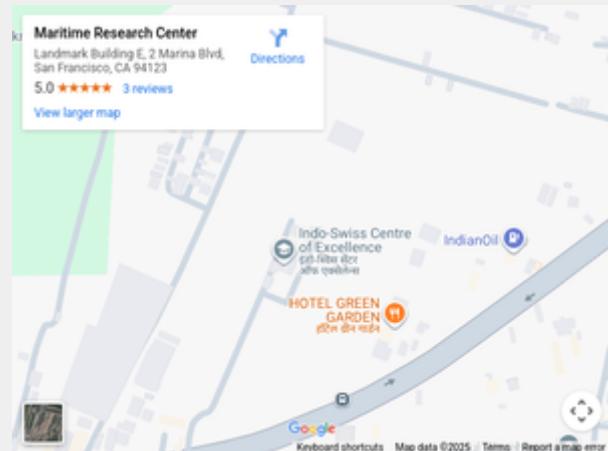
Internship, Fellowship and Research, Individual Membership, Corporate Membership, Academia Membership.

### Support MRC Initiatives



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### Map



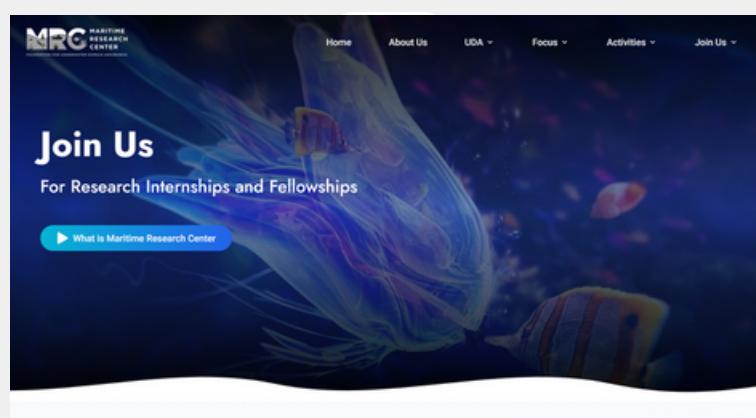
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