

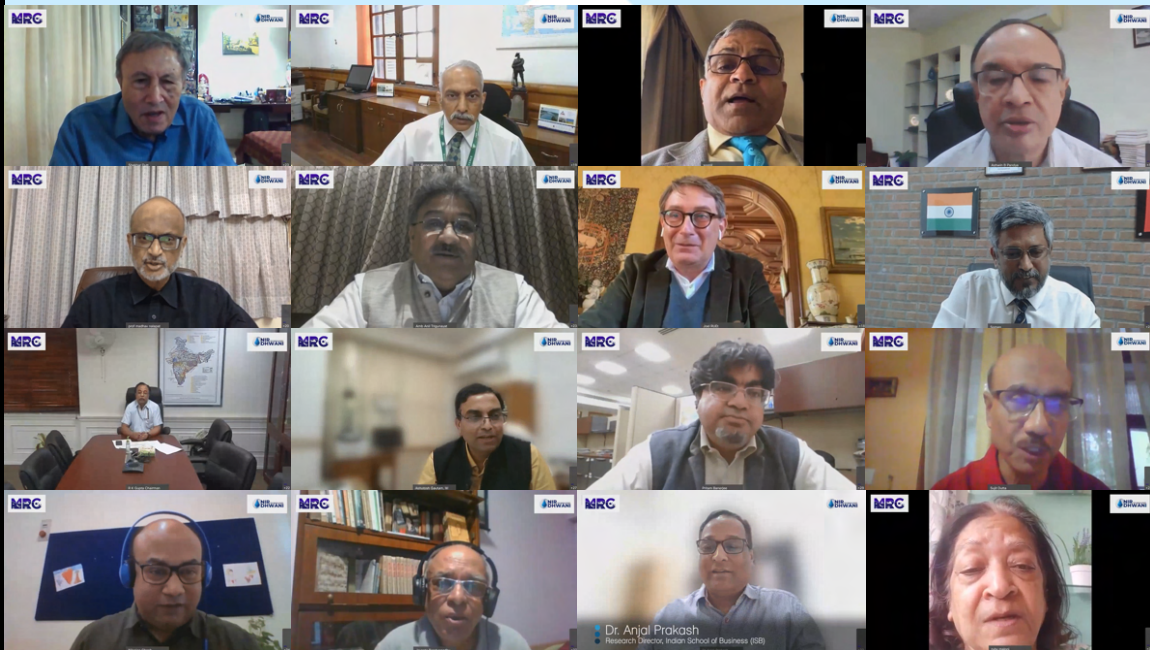


FOUNDATION FOR UNDERWATER DOMAIN AWARENESS

UNDERWATER DOMAIN AWARENESS (UDA) QUARTERLY UPDATE

Come, Take a Tour of the 2nd Quarter of Year 2022, With Us!

FLAGSHIP EVENTS



2nd Quarter at a Glance



4
Webinars



40+ Esteemed
Speakers



500+
Participants



2 Lac+
Social Media
Reach



11
UDA Digest
Articles



200+
Internship
Application

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Late. Rashmi Bora Das

Director
Maritime Research Center, Pune
NirDhwani Technology Pvt Ltd

You Live in our hearts & thoughts forever.

It is with deep sadness and heavy hearts that we inform you of the demise of **Mrs Rashmi Bora Das** on **5th June 2022**.

Mrs Rashmi was a **Director at Maritime Research Center (MRC) and NirDhwani Technology Pvt Ltd. (NDT)**. She was a pillar of support to both organizations.

Her contribution as part of the leadership at MRC and NDT will continue to be a source of inspiration to us.

Webinar

#4 COP26 AND THE BRAHMAPUTRA
A NEW PERSPECTIVE BASED ON THE
UNDERWATER DOMAIN AWARENESS (UDA) FRAMEWORK

Tuesday 05 April 2022 | 1600 hrs

ESTEEMED GUESTS

- LT GEN V C KHANDARE (RETD)
Member of the Defence Ministry,
Former Military Adviser, NSCS
- SHRI HIRJI
Joint SAG,
General of Police
- MILANJAN CHOSH
Deputy Chief Scientist
- DR (CDR) ARNAB DAS
Founder & Director,
MRC, Pune
- PROF ANJAL PRAKASH
Research Director, IISB
School of Business (ISB)
- PROF SUCHARITA SEN
School of Global Enterprise,
IITM, Delhi
- DR. RUBY MALONI
Former Head, Dept of
History, University of
Mumbai
- PROF JAYANTA BANDYOPADHYAY
Former Professor at IIT Bombay,
Canada
- MS ANANYA MALIK
MRC Research Associate,
Brahmaputra

HOSTS

COP26 and the Brahmaputra

04/06 A New Perspective Based
on the Underwater Domain
Awareness (UDA) Framework

05 April 2022

[Click to Read More](#)

#5 COP26 AND THE BRAHMAPUTRA
A NEW PERSPECTIVE BASED ON THE
UNDERWATER DOMAIN AWARENESS (UDA) FRAMEWORK

Thursday 05 May 2022 | 1600 hrs

ESTEEMED GUESTS

- SHRI ASHWIN B PANDYA
Secretary General, ICD 454
Former Chairman of CWC
- DR. DEE DUFF
Chairman,
Outer Space
Commission (OSC)
- DR. ANJALI
Nanyang Technological University,
Singapore
- MR. JEEL BUEY
Professor,
Strasbourg, France
- MR. ARNAB BANDYOPADHYAY
Lead Strategist, IISB
at World Bank India
- DR. PRITAM BANERJEE
Former Head,
Department of
Development Bank
- DR (CDR) ARNAB DAS
Founder & Director,
MRC, Pune
- MS ANANYA MALIK
MRC Research Associate,
Brahmaputra

HOSTS

COP26 and the Brahmaputra

05/06 A New Perspective Based
on the Underwater Domain
Awareness (UDA) Framework

05 May 2022

[Click to Read More](#)

**AUSTRALIA, UNITED KINGDOM AND THE UNITED STATE (AUKUS):
A NEW PERSPECTIVE BASED ON THE
UNDERWATER DOMAIN AWARENESS (UDA) FRAMEWORK**

21 May 2022 | 1600 Hrs

ESTEEMED GUESTS

- SHRI SHEKHAR DUTT
Former Deputy NSA and
Former Defence Secretary
- VICE ADMIRAL V BHOJ
AVSM, YSM, NM
- DR. ANJALI
Former Director, IISB
Distinguished Fellow at VIT
Delhi
- DR (CDR) ARNAB DAS
Founder & Director,
MRC, Pune
- PROF MADHAV DAS NALAPAT
Vice-Chief of Global Advanced
Research Group & Director of Dept
of Geopolitics & International
Relations at Manipal University
- PROF SUJIT DUTTA
Gandhi Chair at the Nelson
Mandela Centre for Peace
and Conflict Resolution,
Jamia Millia Islamia, Delhi
- CMDE SOMEN BANERJEE
Former Research Fellow
at VIT, New Delhi
- MS NISHITHA VISHWAKARMA
MRC Communications &
Advocacy Fellow

HOSTS

Australia, United Kingdom & the United States (AUKUS)

A New Perspective based on the
Underwater Domain Awareness
(UDA) Framework

21 May 2022

[Click to Read More](#)

Online Workshop on
**WORLD ENVIRONMENT DAY
UNDERWATER DOMAIN AWARENESS (UDA) FRAMEWORK
AND THE OPPORTUNITIES FOR YOUNG INDIA IN THE NEW GLOBAL ERA**

Wednesday 05 Jun 22 | 1600 hrs

ESTEEMED GUESTS

- MR. ATHARVA NAGARKAR
Tech, IIT Pune
- MR. HARSH KUMAR
Tech, IIT Bombay
- MR. SOHAN
Tech, IIT Bombay
- DR. ANJALI
Former Director, IISB
Distinguished Fellow at VIT
Delhi
- MRS. KABITA TANWAR
Past Doctoral Fellow,
University of Mumbai
- MR. SIDDHANT RATNA
Tech, IIT Bombay
- MS NEHA SHARDE
MRC Fellow
- MS. NEERUJA SHOME
MRC Fellow
- MR. SIDDHANT BHARGHOSHAN
Mentor to the Interns at MRC
- DR (CDR) ARNAB DAS
Founder & Director,
MRC, Pune
- MS ANANYA MALIK
Internship Coordinator

HOSTS

World Environment Day Workshop

Projects undertaken by Interns
from IIT Bombay, & Kharagpur, VIT
Pune and University of Mumbai

05 June 2022

MRC Updates

Vivekananda Sustainability Award 2022



On 20th April 2022 , our Founder and Director, Dr (Cdr) Arnab Das was conferred with the 'Replenishment of and Sustainable Practices in Harnessing Marine Ecosystems Award' by the Vivekananda Foundation.

[Click here to View the Post](#)

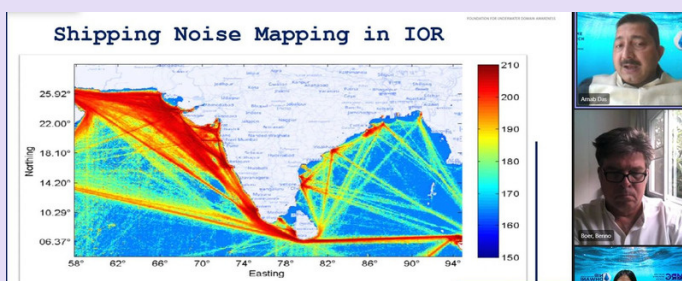
MoU signing with the Pathfinder Foundation of Sri Lanka

The Pathfinder Foundation (PF) of Sri Lanka has signed a memorandum of understanding (MoU) with the Maritime Research Center (MRC), aimed at collaborating and engaging in research in Underwater Domain Awareness (UDA).

[Click here to View the Post](#)



Shipping Noise Mapping in IOR



Interaction with Mr. Benno Boer, Chief of Natural Sciences, UNESCO

The discussion involved how we can prioritize UDA Framework to bring up more biosphere reserves in India.

Additionally, Dr Arnab Das apprised Mr. Boer regarding the progress that UDA Framework has made in past couple of years and how the Framework is being considered at the tables of BIMSTEC and IORA groupings.

[Click here to View the Post](#)



Armoogum Parsuramen
14 June at 21:00 · 🌐

UDA Framework Workshop scheduled in August 2022

Dr Amroogam Parsuramen, Former Education Minister Mauritius, UNESCO Director and Chairman of Global Rainbow Foundation met with Mr Eric Falt, Director of UNESCO, New Delhi Office.

[Click here to View the Post](#)

Pathfinder Foundation posted about signing of MoU with MRC

The Pathfinder Foundation signed a memorandum of understanding (MoU) with the Maritime Research Center (MRC) based in Pune, India, towards engaging in collaboration and research on the area of Underwater Domain Awareness (UDA).

[Click here to View the Post](#)



Pathfinder Foundation
17 May · 🌐



Dr (Cdr) Arnab Das's visit to Colombo

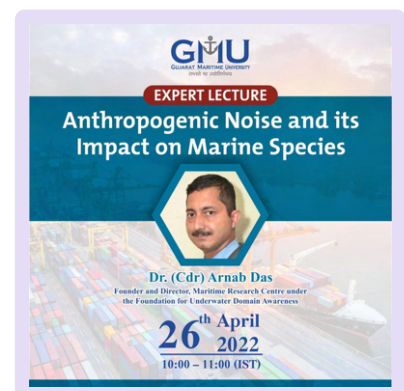
Dr. (Cdr) Arnab Das, Founder & Director Maritime Research Centre (MRC), Pune, visited Colombo with effect from 09 to 11 May 2022, at the invitation of the Pathfinder Foundation (PF)

[Click here to View the Post](#)

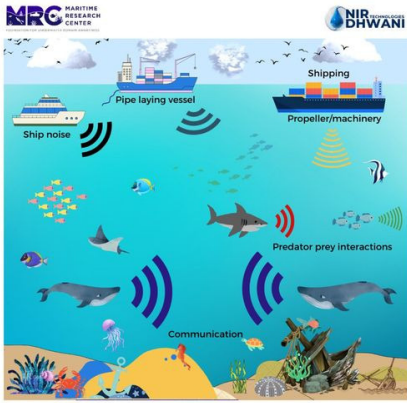
Expert Lecture at Gujarat Maritime University

Dr. (Cdr) Arnab Das, addressed the students of Gujarat Maritime University on the topic of "Anthropogenic Noise and its Impact on Marine Species"

[Click here to View the Post](#)



Research Archives



Shipping Radiated Noise Estimation Techniques

Shipping Radiated Noise Estimation Using AI

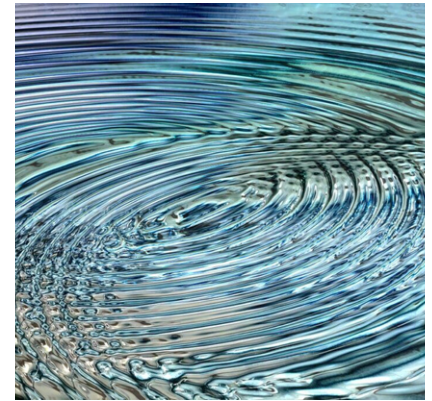
[Click here to Know more](#)



Radiated Noise Generation

Radiated Noise Generation

[Click here to Know more](#)



Low frequency Shipping Ambient Noise Mapping for Passive Sonar Simulator

[Click here to Know more](#)

Important Interactions



Colonel RKARP Rathnayake RSP USP psc accompanied by Dr. K Sanath Chandana de Silva, met Dr(Cdr) Arnab Das to discuss UDA framework.



Our Founder and Director Dr (Cdr) Arnab Das on his visit to Sri-Lanka interacted with Dr Dayaratna Silva, Executive Director of the Pathfinder Foundation.

MRC Internship and Fellowship

To Know more about **Internship/ Fellowship Opportunities,**

[Click here](#)



Abhishek Shetkar

IIT Hyderabad

AUV Design and Development: Electrical Sub System



Ashutosh Khandal

IIT Delhi

A Machine Learning Model for estimating Shipping Noise in Indian Ocean Region



Atharva Vikrant Nagarkar

VIT Pune

Noise and Vibration studies onboard Marine Vessels



Boda Sharath Pavan

IIT Bombay

Autonomous Underwater Vehical: Mechanical and Electrical subsystem



Deepanshu Chouhan

IIT Hyderabad

Sediment Management



Harsh Kumar

IIT Bombay

Autonomous Underwater Vehical: Navigation subsystem



Kaushik Rajput

IIT Delhi

Three Dimensional Ambient Noise mapping of the Indian Ocean Region



Nayanika Shome

Symbiosis School for Liberal Arts

Ethnography and Global connections in the Archaeological memory of the River Brahmaputra



Neha Dadke

Symbiosis School for Liberal Arts

A synthesis of histories written for and about the River Brahmaputra



Prakash S
IIT Kharagpur
Seaweed and its growth



Romit Rajendra Kaware
IIT Delhi
Sediment classification in
tropical waters for sediment
bearing pressure analysis



Sanskar Soni
IIT Delhi
Effective detection model for
Passive Sonar Simulator



Mrs. Sarita Tanwar
Mumbai University
Seaweeds Wonderplants
of the Sea



Satti Neelakanta Kalyan Veera Bhadr
IIT Delhi
Pollution and Biomagnification
and its impacts on the marine
life



Shivam Yadav
IIT Hyderabad
Area Production Yield Analysis
Web Tool for Shrimp and
Seaweed Farming

International Students



Siddhant Batra
IIT Mumbai
Area Production Yield Analysis
Web Tool for Seaweed



Harish Sagar Kamalakumar
*General Sir John Kotelawala Defence
University, Colombo, Sri Lanka*
Indo-Sri Lankan Relations: A New Perspective
Based on the (UDA) Framework

Fortnightly Articles

*Click on the image to Read the full article

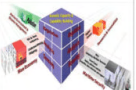
The Sunday Guardian

QUAD needs a new perspective based on UDA



QUAD needs a new perspective based on UDA. The Quad members need to understand the importance of UDA in the Indo-Pacific region. The Quad members need to understand the importance of UDA in the Indo-Pacific region. The Quad members need to understand the importance of UDA in the Indo-Pacific region.

The Quad members need to understand the importance of UDA in the Indo-Pacific region. The Quad members need to understand the importance of UDA in the Indo-Pacific region. The Quad members need to understand the importance of UDA in the Indo-Pacific region.



The Daily Guardian

Review

UDA framework for BIMSTEC and the way forward

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), a regional multilateral organization founded in 1997, offers a well-positioned platform to help address a multitude of challenges.

OPINION



ARAB DAS discusses the importance of the UDA framework for BIMSTEC. The UDA framework is a key to sustainable development in the Indo-Pacific region. The UDA framework is a key to sustainable development in the Indo-Pacific region.



UDA FRAMEWORK FOR BIMSTEC is a key to sustainable development. The UDA framework is a key to sustainable development in the Indo-Pacific region. The UDA framework is a key to sustainable development in the Indo-Pacific region.

Sunday Guardian

QUAD needs a new perspective based on UDA

The Daily Guardian

UDA Framework for BIMSTEC and the way forward

geopolitics



UDA FRAMEWORK FOR SUSTAINABLE BLUE ECONOMY

The pooling of resources and synergising of efforts, enumerated as the core value of the UDA framework, can effectively manage the challenges and opportunities of the tropical littoral waters of the Indo-Pacific region, explains **ARAB DAS**

Geopolitics

UDA framework for sustainable blue economy

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Conferences | OCEANS 2022 - Chennai

AI & ML based Implementation of the Underwater Channel Model in the Tropical Littoral Waters of the Indian Ocean Region (IOR)

Publisher: IEEE | Cite This | PDF

Rishabh Patra | Shrivard Prabhuraman | Arbab Das | All Authors

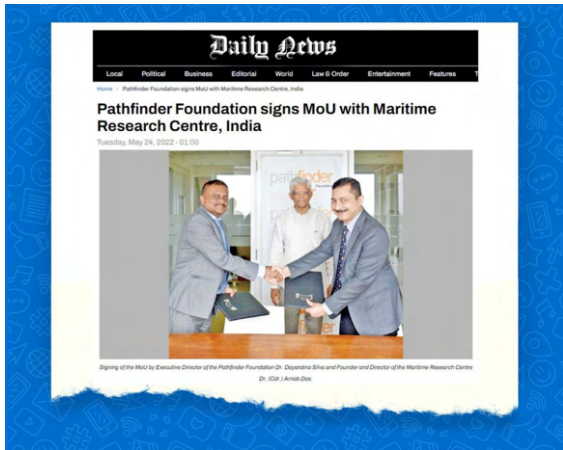
Full Text Views

Abstract
Acoustic waves are one of the predominant modes of signal propagation, in the underwater domain for numerous reasons. The Indian Ocean Region (IOR) is a strategic location and has been bustling with trade and military activities, particularly in the 21st century. However, the tropical littoral waters of the IOR have ensured sub-optimal performance of any sonar deployment in the region due to the high SOFAR channel depth. Thus making the entire region acoustically shallow and ensuring multiple interactions of the acoustic propagations with the surface and the bottom boundaries. Additionally, random fluctuations in the surface roughness and bottom type further add to the complexity of propagation. Thus, underwater channel modeling is an interesting research problem with substantial applications across multiple stakeholders in the IOR. The rich biodiversity of the tropical littoral waters adds another dimension to the acoustic signal deterioration, as the random attenuation interfaces, even for the direct path propagation in the water body. It is in order that we map the underwater medium parameters like wind, speed, surface temperature, salinity, sound speed profile, bottom type, bottom profile, and more. The Modeling & Simulation (M&S) effort to map the underwater channel across all seasonal and diurnal variations, is a critical step to contain the impact on acoustic propagation. The real-time prediction of the underwater channel behavior through this M&S effort will facilitate mitigation of the underwater channel impact. The current methods of acoustic channel modeling have been mathematical, deriving differential equations from the fundamental equations of state, with different assumptions that lead to different models of use, limited to different regions. Due to the variability of the IOR waters, a range-dependent acoustic model is most suitable for the region, the downside being the high-compute times and specialized hardware required, rendering these approaches useless for real-time calculations. We propose a data-centric approach based on the current state-of-the-art ML algorithms, to learn from simulation data. Recent Deep Learning approaches have proven really successful in learning distributions conditioned on the input, making them universal function approximators. Considering the fact that the acoustic

IEEE Xplore

AI & ML based Implementation of the Underwater Channel Model in the Tropical Littoral Waters of the Indian Ocean Region (IOR)

Media Articles



MoU Signing

Pathfinder Foundation signs MoU with Maritime Research Centre, India

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Need for Underwater Domain Awareness (UDA)

There is a pressing need for India to develop a comprehensive Underwater Domain Awareness strategy

[Click here to Know more](#)



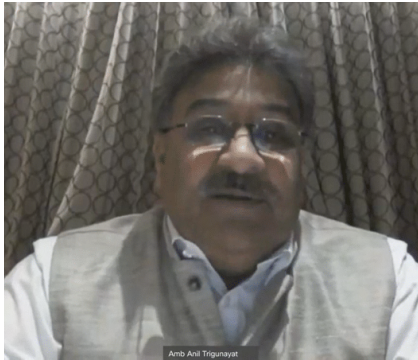
Vivekananda Foundation Award

Dr (Cdr) Arnab Das, Maritime Research Center received the award for the Replenishment of and sustainable practices in harnessing marine ecosystems

[Click here to Know more](#)



UDA Dialogue Videos



Pandemic and Underwater Domain Awareness

Amb Anil Trigunayat
Former Diplomat and Distinguished Fellow at VIF Delhi

Watch



The Importance of hard power to dominate the Sea.

Shri Shekhar Dutt
Former Deputy NSA and Former Defence Secretary

Watch



In the 21st century, Indo Pacific Region has gained tremendous attention worldwide.

Vice Admiral S V Bhokare (Retd)
Former Diplomat and Distinguished Fellow at VIF Delhi

Watch



Navy, Underwater Domain, Geopolitical Scenario in Indian Ocean Region

Prof Madhav Das Nalapat
UNESCO Peace Chair at Manipal University

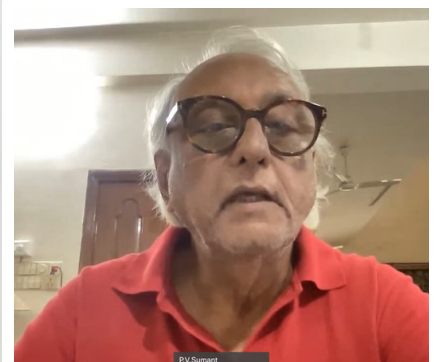
Watch



Harnessing Bramhaputra water for transport.

Shri Jayant Singh
Vice Chairman, Inland Water Transport Authority of India.

Watch

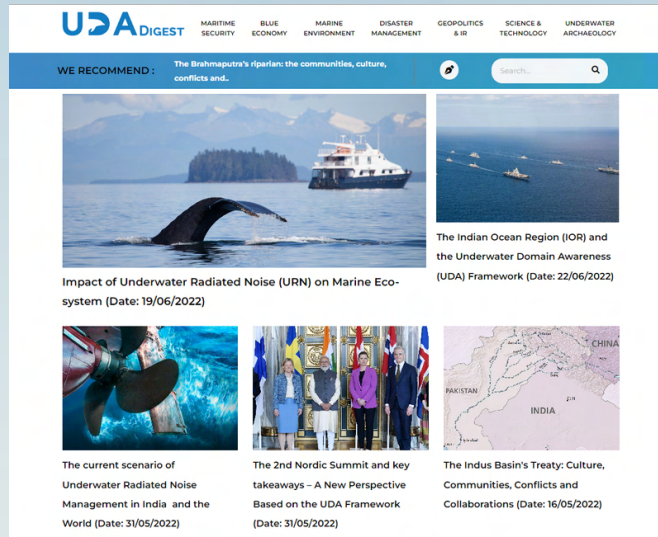


The Riveting History of the Brahmaputra River

Shri P V Sumant IPS (Retd)
Former Director Genral of Police, Assam.

Watch

UDA DIGEST



The **UDA Digest** completes one year of its incredible journey. It began as a one stop destination for expert knowledge on the **Underwater Domain Awareness (UDA) Framework**. Since its inception, UDA Digest has been collaborating diverse views and thoughts in the form of **short articles, videos, commentaries, creative posts, and more.**

UDA Digest Articles



Impact of Underwater Radiated Noise (URN) on Marine Eco-system

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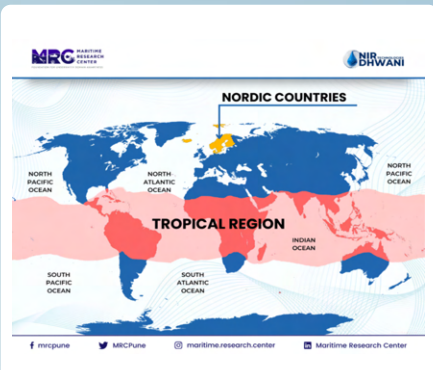
The Indian Ocean Region (IOR) and the Underwater Domain Awareness (UDA) Framework

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The Indus Basin's Treaty: Culture, Communities, Conflicts and Collaborations

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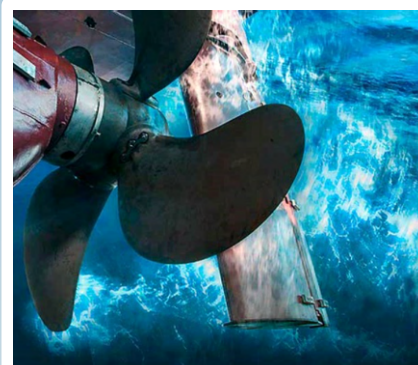
The 2nd Nordic Summit and key take aways – A New Perspective Based on the UDA Framework

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Noise and vibration management for marine vessels

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The current scenario of Underwater Radiated Noise Management in India and the World

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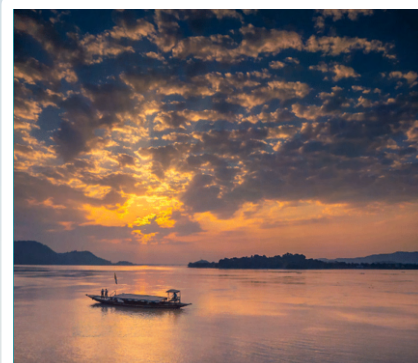
Indo-Sri Lankan Relations: A New Perspective Based on the Underwater Domain Awareness (UDA) Framework

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Sri Lanka's Maritime Cooperation for regional growth and prosperity

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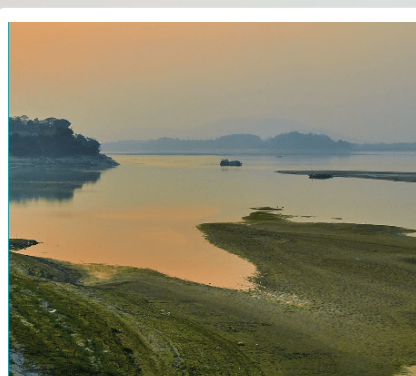
The Brahmaputra's riparian: the communities, culture, conflicts, and collaborations

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India-Sri Lanka relations and the BIMSTEC: A new perspective based on UDA Framework

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Time to realise the potential of Brahmaputra river

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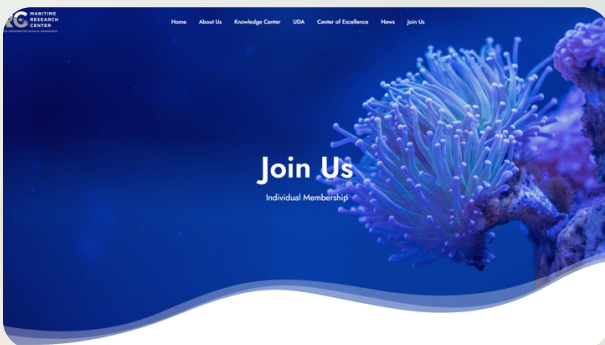
Checkout our Digital Brochure



[Digital Brochure](#)

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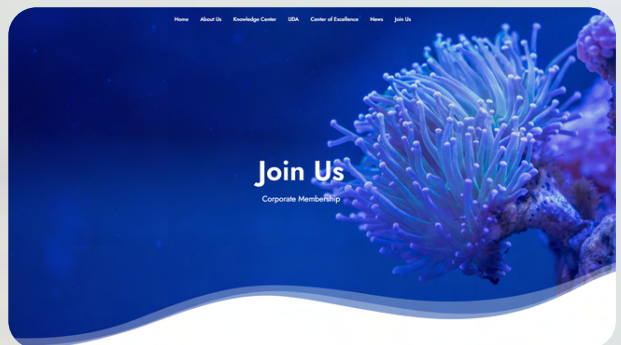
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