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पृथ्वी विज्ञान मंत्रालय Ministry of Earth Sciences

## Vol. 3 October-December 2024

## DR M RAVICHANDRAN Secretary to the Government of India Ministry of Earth Sciences

Under the visionary leadership of Hon'ble Prime Minister Shri Narendra Modi Ji and Hon'ble Minister of Earth Sciences Dr Jitendra Singh Ji, we are witnessing remarkable progress in earth system sciences in India. Our focus also remains on outreach and public connect. We proudly participated in the India International Science Festival (IISF) 2024 in Guwahati, Assam. Our Ministry and its institutes exhibited activities, advancements, their contributions and initiatives. At Sagarika-The Tale of Earth Sciences, a sub-event hosted by MoES at the IISF 2024, we witnessed a platform for

collaborative discussions on challenges and opportunities in the field. As we approach 150 years of the India Meteorological Department in 2025, we celebrate continued innovation and remarkable progress in weather forecasting and disaster preparedness. Marking another milestone, the National Centre for Medium-Range Weather Forecasting, Noida, completed 30 years of operational Numerical Weather Prediction, reinforcing its vital role in accurate forecasting. Recognising the importance of localised weather insights, we are collaborating with the Ministry of Panchayati Raj to







deliver Gram Panchayat-level weather forecasts, a critical step amid rising global warming and the need for hyperlocal weather forecasts.

Reflecting on history, I had the privilege of attending the Conclave commemorating the 2004 Indian Ocean Tsunami at INCOIS, Hyderabad. From having negligible prior expertise about tsunamis to now being home to a globally recognised Tsunami Early Warning System, our journey is a testament to scientific progress. We launched the High-Performance Computer 'TARANG' at the India National Centre for Ocean Information Services, Hyderabad, to further enhance our computational capabilities, setting new benchmarks in ocean research and forecasting. This system augments the HPCs Arka and Arunika at IITM and NCMRWF totalling our computing capabilities to more than 22 petaflops.

We hosted the BIMSTEC meeting at NCMRWF Noida, strengthening regional cooperation and fostering international partnerships in Earth Sciences. With these developments, I firmly believe that expanding cooperation, collaboration, and promoting scientific R&D within the country and across borders will propel Earth Sciences to new heights, ensuring a better future for society.

# Ministry of Earth Sciences (MoES)

The Ministry of Earth Sciences holistically addresses all components of Earth system sciences (atmosphere/ air, hydrosphere/water, cryosphere/frozen solid, lithosphere/land and biosphere/ life and their complex interactions) to provide reliable services for the country.

Ministry of Earth Sciences is mandated to provide services for weather, climate, ocean and coastal state, hydrology, seismology and natural hazards; explore and harness marine living and non-living resources sustainably; and explore the Earth's poles (Arctic, Antarctic) and the Himalayas. The functions of Ministry of Earth Sciences are to augment and sustain long-term observations of the atmosphere, ocean, cryosphere and solid earth to record the vital signs of the Earth System and change; to develop forecasting capability of atmosphere and oceanic phenomena through dynamical models and assimilation techniques and to build prediction system for weather climate and hazards; to understand the interaction between components of Earth Systems and human systems at various spatial and temporal scales; to explore polar and high seas regions of the Earth towards the discovery of new phenomena and resources; to translate knowledge and insights from Earth systems science into services for societal, environmental and economic benefit; and development of ocean technology for exploration of oceanic resources and societal applications. The services provided by the Ministry of Earth Sciences cater to various international and national agencies, state governments, and local bodies for societal benefit.

The research and development and operational (service activities of the Ministry of Earth Sciences are carried out under:

- 1. PRITHvi VIgyan (PRITHVI)
- 2. Deep Ocean Mission (DoM)
- 3. Mission Mausam

The Deep Ocean Mission, approved by the Cabinet in 2021, aims to develop deep-sea technologies for manned submersible, deep-sea mining and deepsea exploration; expansion of ocean climate change advisory services; exploration and conservation of marine biodiversity; acquisition of an ocean research vessel, and deep-sea mineral surveys and exploration; and capacity building in marine biology.



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In September 2024, MoES launched the Mission Mausam, which aims to make the country weatherready and climate-smart. The aim is to significantly elevate India's observations infrastructure and further integrate and strengthen capabilities in data acquisition and analysis, modelling, forecasting and prediction. Also envisioned are achieving a quantum leap in computational apparatus and data-driven weather management for public benefit and the nation's progress.

Ministry of Earth Sciences mandate is pursued through eleven institutes: India Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM), National Centre for Medium-Range Weather Forecasting (NCMRWF), National Institute of Ocean Technology (NIOT), Indian National Centre for Ocean Information Services (INCOIS), National Centre for Polar and Ocean Research (NCPOR), National Centre for Earth Science Studies (NCESS), National Centre of Coastal Research (NCCR), National Centre for Seismology (NCS), Centre for Marine Living Resources and Ecology (CMLRE), and Borehole Geophysics Research Laboratory (BGRL).

The Ministry of Earth Sciences website is www.moes. gov.in. Updates are available on social media (Twitter, Instagram, Facebook, LinkedIn, and YouTube) @moesgoi.



# **MoES in News**

• Ministry of Earth Sciences Concludes Activities under Special Campaign 3.0

• Ministry of Earth Sciences makes

**Special Campaign 4.0** 

Substantial Interim Progress under



- Ministry of Earth Sciences successfully concludes Special Campaign 4.0, marks Key Achievements
- Dr Jitendra Singh felicitated trainees nominated by the International Seabed Authority at the Ministry of Earth Sciences
- India felicitates foreign ISA Trainees from 6 countries in Ocean Exploration after completion of specialised programme conducted by Ministry of Earth Sciences
- Parliament Question: Radar Forecasting System
- Parliament Question: IMD'S Observation on Weather Forecasting for coastal areas of Kerala
- Parliament Question: Global Leadership of India in Climate Science
- Parliament Question: Alarming rate of heat waves in the country
- Parliament Question: Expansion of radar network for Himanchal Pradesh

















- Parliament Question: Weather Radars under Mission Mausam
- Parliament Question: Study on Frequent Earthquakes
- Parliament Question: Automated Earth Stations for Farmers
- Parliament Question: Steps to increase the weather radars in the country
- Parliament Question: Earthquake disaster management
- Parliament Question: Microclimate forecasting
- Parliament Question: Monsoon prediction accuracy
- Parliament Question: Installation of real-time flood forecasting system
- Parliament Question: Tarang Facility At The Indian National Centre For Ocean Information Services
- Parliament Question: Mission Mausam To Boost The Radar Network
- Parliament Question: Committee On Disaster Risk Reduction (CoDRR)

























# **MoES in News**

- Parliament Question: Fourth Global Coral Bleaching Event
- "Mission Mausam" to be a gamechanger for India's weather forecast capabilities: – Dr Jitendra Singh
- Parliament Question: Improving accuracy of Weather Forecasting
- Parliament Question: Viksit Bharat
- Parliament Question: El Nino effect on monsoon and rainfall
- Parliament Question: Early Warning System for Natural Disaster
- Parliament Question: Expansion of Weather Radar Network under Mission Mausam
- Parliament Question: Mission Mausam
- Parliament Question: Effect of La Nina
- Parliament Question: Doppler Radar Station at Balasore
- Parliament Question: Implementation of Mission Mausam in the North-East Region























- Parliament Question: Mission Mausam
- Parliament Question: Promotion of Blue Economy
- Parliament Question: Stretches of coastline for Restoration
- Parliament Question: Phenomenon on El Nino-Southern Oscillation
- Parliament Question: Plan to improve weather forecasting
- Parliament Question: Impacts of Climate Change on Weather Patterns
- Parliament Question: Rise in Earth's Temperature
- Parliament Question: Need for Preparedness in Earthquake-Prone Zones
- Mission Mausam Enhancing Weather and Climate Resilience for India
- India today global leader in 'disaster warning' systems, catering to other nations as well across the world
- Year-End Review Major Achievements



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# Press Releases from MoES

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मंत्रालय Ministry of Earth Sciences



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# Press Releases from MoES



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Due to climate change, annual temperature is increasing globally, and the impact of the same is reflected in the rising frequency and intensity of extreme weather events in various parts of the globe, including India. globe, including India. The India Mesonological Department (IMD) inner-strutum outdock/ferestativarianing for the policia as vel ai distater management authorities to prepare for extreme weather events and to adapt and minigate various extreme weather-related risks. IMD started issuing Impell Based Ferestatis (III), which gives details of what the weather will do rather than what he weather will be it contains the details of impests expected from the sevene weather demonstra and pairly due to the sevene weather demonstra and pairly due to the sevene weather demonstra and pairly due to the sevene weather evene weather.

ed to severe weather. India today global leader in 'disaster warning' systems, atering to other nations as well across the world

India Advances Global Cooperation and Multi-Hazard Preparedness to Safeguard Coastal Communities across the planet: Dr. Jitendra Singh

PM Sh Narendra Modi's pathbreaking ocean initiatives like 'Deep Sea Mission' and rapid strides and be recognised as the world's most state of the art institute of its kind

votado DR: 20 JRA: alter as current by two local Science and Technology. Earth Sciences (Series) Science and Technology. Earth Sciences (Series) (S

# ARLIAMENT QUESTION: EARLY WARNING SYSTEMS FOR NATURAL DISASTERS

### Posted On: 11 DEC 2024 4:38PM by PIB Date

Point of it take of a case case in prime tang taketo of the case it is a case of the case of the image Change Research, Indian Institute of Poincal Meteorology (ITM) for generating imate change projections in the region. The projections has been released to benefit students, searchers, and policymakers. The report is allable

available and a strain of the second strain of t

Posted On 18 DEC 2024 SQUPM by PBB Date The Mission Marsom was launched in methods and its servinaged to be a method and transformative institute of the method of the serving of the serving block of the serving of the serving method of the service of the service Mission for the service of the service of the service washest of the service of the service washest events and the impacts of themes the service of the service of the service of the service of the service of the service service of the service of the service of the service service of the service of the service of the service service of the service of the service of the service service of the service of the

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Ministry of Earth Sciencer

# PARLIAMENT QUESTION: PLAN TO IMPROVE WEATHER FORECASTING

### Posted On: 19 DEC 2024 1:19PM by PIB Delhi

Posted Or: 10 DEC 2024 1:19PM by PIB DetH The Ministry of Earth Sciences (MolES) integrating artificial intelligence (A1) and Machine Learning (ML) technologies into wather, climata, and ocean forecasting systems, apart from physics-based numerical models. This predictions, which are envisiol for various sectors, including agriculture, disaster management, and predictions, which key initiatives in the regard include the establishment of a specialized virtual Mateonology (IITM) in Punc. This center fosuses advances in the Tarib Sciences. It has already advances in the Tarib Sciences and advances of advances in the Tarib Sciences and the analysis advances in the Tarib Sciences and the analysis advances of the providences and the analysis of verseting ad AlvHC based applications tarbored for isoland providences and the analysis of weather and climate providences.

## Year-End Review

### Major Achieve Dn: 30 DEC 2024 2:44PM by PIB Delhi

Peated Co: 30 DEC 2024 2-44PM by PIB Debi Using Cabinet approved the "PRTITU' Vigyan (PRTITU') overarching scheme of MoLS for implementation during the period from 20:1-30 at no verall cost of 16.8.4.797 crores. The scheme encompasus five outgoing usb-chemes, namely Annophere & Climate Research- Modelling Observing Systems & Scrubes, Namel Annophere & Climate Research-Modelling Observing Systems & Scrubes (SACR) and Research, Education, Training and Oareach (REACHOT). I binon Cabinet approved the 'Mission Omasam' on Spersheem 11, 2024, with an outgo of 2,000 ceress new two years. Mission Masams in servisaged to be an amhi-faced and transformative initiative to boost India's weather and climate-tedied science, research, and services.

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# PARLIAMENT QUESTION: IMPACTS OF CLIMATE CHANGE ON WEATHER PATTERNS

Ministry of Earth Sciences

wing objectives: Strengthening observations (in-situ & remote sensing) and improved model capability to be able to plan and protect life and property from extreme and high-impact vanher Gaining a better understanding and use of Science, Innovation and Technology, and Data Science for societal benefit

## d On: 19 DEC 2024 1:20PM by PIB Delhi

The Government has taken due note of Climate Change across the country and is making several efforts to assess and minimize the impact of climate change. The multi-faceted approach is aimed at addressing the potential impects or climate change on the country, weather patterns, focusing on adaptation, mitigation, and resilience-building.

## Key initiatives include:

way immanyes include: National Action Plan on Climate Change (VAPCC): Launched in 2006, it outlines eight national missions that focus on promoting sustainable development while addressing climate change. These include missions on solar energy, energy efficiency, sustainable agriculture, and water conservation.



economy in the country. The National Monsoon Mission aims to build avorking partnership between the academic and international, and too growthe operational and another the second second second second develop relevant clientas applications for agriculture, blyodrogg and gover sectors, It also agriculture, blyodrog agriculture, agricultu

PARLIAMENT QUESTION: RISE I EARTH'S TEMPERATURE Ministry of Earth S 7. notsa d On: 19 DEC 2024 1:22PM by PIB Delhi

# Postad On: 10 DEC 2024 122PM by PIB Dahi Importante and a sense of the inpact of infrante change arrows the county, covering all of the end of Clinate Change and the end of the end of Clinate Change and the end of the end of Clinate Change (IPCC). Despite and the end of Clinate Change (IPCC) Despite the bing and on Clinate Change (IPCC) Despite the bing and on Clinate Change (IPCC). Despite the bind of the one of the thing (bab) isose the bind and to one orient clinate change the bind and the one pite on Clinate Clinate Change (SAPCC). These plans energy energy efficiency, vater conversion and environment of the state Action Plan on encourpast specific mixed and a strategic knowledge for climate change. The NARCC PARLIAMENT QUESTION: Need for preparedness in earthquake prone zones

Posted On: 19 DEC 2024 1:25PM by PIB Delhi Poded On: 19 DEC 2024 1:25PM by PB Deht Tex Kangn earthquak of 1005, one of the most eventating earthquakes in bala's history, server as terminder of the local, including limitation destruction, loss of this, and leds a loss of the one has and in bightplace having for one has and in sentipatively information expectations in earthquake information distances and an another and poly assumes.

awarenes. Son 100 more seismological observatories be added to the tecturological network of Ind NGS-MolS. Typically, such initiatives are at better earthquake monitoring, early wa systems, and research into seismic activity timelines for operationalization can

Enhancing Weather and Climate Resilience for India Posted On: 23 DEC 2024 4:05PM by PIB Delhi INTRODUCTION

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MISSION MAUSAM

# INTRODUCTION INTRODUCTION White indiverse perpendy and climate, India is heavily influenced by venture and measure patterns. Recogning due critical and a second neural works and the second second second second country where agriculture is a primory includeou, on September 11, 2024, the Union Cabiner under the Modi Gavernment al angeproved Mission Mausam, a Induntar, initiative by the Ministry of Erarth Sciences (ModES), with a budget of (2,000 croces over two years. Designed to position India a global leader in weather and elimate selences, the mission aims to make antices "Heather Ready" and "Climate Smart', meeting the global standards.

Ocean Exploration Key to 'Viksit Bharat' Goal, says the Minister Dr. Jitendra Singh Highlights India's Progress in Ocean Research and Disaster Preparedness at INCOIS Posted On: 26 DEC 2024 3:16PM by PIB Delhi



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# Social Media Highlights

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मंत्रालय Ministry of Earth Sciences



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- The Ministry of Earth Sciences celebrated Swachh Bharat Diwas on October 02, 2024. Hon'ble Minister of Earth Sciences, Dr Jitendra Singh, honoured and felicitated the dedicated sanitation workers at Prithvi Bhawan, New Delhi.
- Dr M Ravichandran, Secretary, MoES, inaugurated TARANG, a state-of-the-art High-Performing Computing (HPC) Facility at INCOIS Hyderabad, on October 22, 2024. With one PetaFLOPS of computing capacity and 2 Pesa Bytes of storage, TARANG is an advanced HPC, setting a new benchmark in oceanographic research.
- IMD organised a training workshop on Weather Forecasts at the Gram Panchayat level with the Ministry of Panchayati Raj on October 24, 2024. The event was inaugurated by the Hon'ble Union Minister for Panchayati Raj, Shri Rajiv Ranjan Singh, in the presence of the Hon'ble Union Minister, Ministry of Earth Sciences Dr Jitendra Singh and Hon'ble Minister of State for Panchayati Raj, Prof SP Singh Baghel.
- Dr M Ravichandran, Secretary, MoES, along with Program Director-OSMART and Prof Balaji Ramakrishnan, Director, NIOTlaid the foundation stone for construction of the pipeline trestle and approach jetty in the NIOT Seafront Campus at Pamanji, and the Centre for Marine Microbial Repository under Deep Ocean Mission in the NIOT-Facility for Computation and Training campus at Chittedu, Andhra Pradesh on November 08, 2024.
- NIOT celebrated its 31st Foundation Day on November 10, 2024, with Dr M Ravichandran, Secretary, MoES, laying the foundation stone for the Centre for Microbial Repository set up under the Deep Ocean Mission and launching the Marine Microbial Information Portal and a website for Advanced Marine Station for Ocean Biology.





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- IITM celebrated 63rd Foundation Day on November 17, 2024.
- Strengthening India's weather monitoring capabilities, IITM installed a state-of-the-art Disdrometer at the Kangra Airport Campus in Dharamshala on November 23, 2024.
- Dr M Ravichandran, Secretary, Ministry of Earth Sciences, attended the ceremonial first cutting of steel for the new Ocean Research Vessel (ORV) being acquired as part of India's Deep Ocean Mission in Kolkata on November 29, 2024.
- MoES co-organised the India International Science Festival (IISF) from November 30 to December 03, 2024, in Guwahati.
- Hon'ble Minister of Earth Sciences, Dr Jitendra Singh, highlighted significant developments and plans across key scientific domains during a press briefing at his residence on December 11, 2024.
- INCOIS hosted a Conclave Commemorating 20 years since the 2004 Indian Ocean Tsunami on December 26, 2024, with Hon'ble Minister of Earth Sciences, Dr Jitendra Singh, gracing the event as the Chief Guest.



NIOT and NCPOR scientists successfully conducted high-resolution deep-sea exploration at 4,500 m depth in the Central and Southwest Indian Ridges of the Southern Indian Ocean in December 2024. This historic mission aboard Sagar Nidhi used NIOT's AUV Ocean Mineral Explorer-OMe 6000, marking the first-ever exploration of hydrothermal sulfide fields at these specific sites.



# **News from MoES**

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 NIOT conducted exploratory mining trials for polymetallic nodules (PMN) in the Andaman Sea. The Geological Survey of India surveyed and identified these locations utilising NIOT's seabed mining machine, Varaha-3, the NIOT team collected PMN measuring 60-120 mm from a depth of 1193 m.



- NCESS organised a two-day Earth System Science Organisation (ESSO) Review Meeting, chaired by Dr M Ravichandran, Secretary, MoES, bringing together key institutions under MoES, including NCESS, NIOT, INCOIS, IITM and more, to discuss major achievements and set ambitious goals for the future of Earth science research and development.
- Dr M Ravichandran, Secretary, MoES, inaugurated the Ballast Water Treatment Technologies Test Facility at Pamanji and Vagarru villages, Andhra Pradesh, in the presence of Prof Balaji Ramakrishnan, Director, NIOT, and senior NIOT officials. This tropical facility supports testing and validation of ballast water treatment systems.



- The Weather and Climate Science for Service Partnership-India Work Package and Collaboration Initiative Meeting was conducted at the Ministry of Earth Sciences HQ, Prithvi Bhawan, New Delhi. Chaired by Dr M Ravichandran, Secretary, MoES, the meeting brought together the delegation from UK Met Office and senior scientists of NCMRWF, IITM, and MoES to explore collaborative opportunities under the WCSSP initiative.
- The 14th Asia-Oceania Meteorological Satellite User Conference (AOMSUC-14) took place at Vigyan Bhawan, New Delhi, with meteorologists, satellite scientists and researchers from around the globe. The event was graced by the presence of Dr Jitendra Singh, Hon'ble Minister of Earth Sciences; Dr M Ravichandran, Secretary, MoES; Dr Mrutyunjay Mohapatra, DG, IMD; Ben Churchill, Director, WMO Regional Office for Asia and the South-West Pacific; and Dr Allen Huang, Chair of AOMSUC.

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- The 3rd meeting of the Mission Management Council (MMC) for review of various activities under Deep Ocean Mission (DOM) was held on October 08, 2024, at Prithvi Bhawan, New Delhi. Chaired by Dr M Ravichandran, Secretary, MoES/Chairman, MMC, key participants of the meeting included Directors and senior officials of MoES DOM institutes and various scientific departments of the Govt of India, including Fisheries, Environment, academia and Indian Navy.
- The 2nd Meeting of the Committee on Antarctic Governance and Environmental Protection (CAG-EP) was held at the Ministry of Earth Sciences, Prithvi Bhawan, New Delhi on October 08, 2024. The participants deliberated upon India's Antarctic activities conducted over the past year, including the forthcoming 44th Indian Scientific Expedition to Antarctica and as part of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).
- NIOT successfully completed the Arabian Sea buoy maintenance cruise onboard ORV Sagar Nidhi from October 10, 2024, to November 06, 2024. The team retrieved and deployed four OMNI, one each for the tsunami, coastal buoy, calval buoy, and ONMS buoy, during this cruise in the Arabian Sea.
- BGRL and University of Liverpool, United Kingdom, jointly organised the meeting and field investigations for the MoES-UKRI collaborative project 'The properties, mechanisms, and hazards of interplate and intraplate earthquakes in India' during October 15 to November 03, 2024.



NCESS conducted a training program for international students from October 21 to 27, 2024, under the MoES and International Seabed Authority (ISA) contract. The program included lectures by esteemed scientists on diverse Earth Sciences topics, along with laboratory visits and hands-on training.

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- NCESS organised a talk on Cyber Security as part of the Cyber Security Awareness Program by Mr Georgie Kurien, CISO and Head of Cyber Assurance, SecnSure, on October 24, 2024.
- NIOT organised an Open Day on November 07, 2024, as part of its 31st Foundation Day celebrations. Approximately 940 students and 27 faculty members visited to explore NIOT's ongoing research and development efforts in Ocean Technology.

# **Events at MoES**

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- NCESS organised a two-day meeting on November 21 to 22, 2024, to establish the Peninsular Indian Coastal Ocean Monitoring System (PICOMS). The event included six sessions with 13 speakers from leading institutes and a panel discussion on addressing gaps in coastal and nearshore research.
- MoES and its autonomous institutes actively participated in the India International Science Festival 2024 Mega Science and Technology Exhibition and the Sagarika program held from November 30 to December 03, 2024, at IIT Guwahati, Assam.





The 7th Meeting of the Task Force on Blue Economy for Sustainable Development was held on December 06, 2024, at the Ministry of Earth Sciences HQ in New Delhi.

- The inaugural session of the Severe Weather Forecasting Programme (SWFP) Regional Training Workshop on Multi-Hazard Early Warning System (MHEWS) Interoperability Implementation took place at Prithvi Bhawan, New Delhi on December 09, 2024 with Dr M Ravichandran, Secretary, MoES, as the Chief Guest and senior officials of MoES and IMD.
- An Interactive Workshop for Gender Sensitisation and Awareness was held at Prithvi Bhawan, New Delhi, on December 09, 2024.
- NCESS hosted two distinguished lectures as part of the Earth Science Forum: Prof Phanikumar Mantha (Michigan State University) delivered a lecture on "Modelling Groundwater – Surface Water Interactions Across Scales, and Dr Peter D Clift (University College London) delivered a lecture on the "Evolution of the Asian Monsoon and Its Impact on the Himalayas."
- NCS and the National Disaster Management Authority jointly organised a Workshop on Earthquake Risk Reduction at Habitat Centre, New Delhi.
- NCCR organised the India Mangrove Conclave 2024 jointly with the Centre for International Forestry Research and World Agroforestry.



- NIOT conducted a competition titled Vision 2047 for young scientists inviting innovative ideas on this theme.
- The 44th Indian Scientific Expedition to Antarctica (44-ISEA) was launched from NCPOR with 25 members reaching Bharati Station via DROMLAN flights. Batchwise induction of the 44th ISEA and de-induction of the 43rd ISEA winter team was conducted.
- NCPOR, in collaboration with the Centre for Earth Sciences & Himalayan Studies, launched the second joint scientific expedition to the Khangri Glacier, Kameng basin in Arunachal Pradesh. The research team conducted various scientific experiments and activities



to study glacier dynamics and their broader impact on the region's ecosystem.





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# Awards and Achievements

- Dr R Krishnan, Director, IITM, was elected Fellow of the National Academy of Sciences, India.
- Dr Thamban Meloth, Director, NCPOR, was an invited expert at the first UAE Antarctic Research Workshop at the National Centre of Meteorology, Abu Dhabi. He delivered two presentations on 'Antarctic Treaty System and Science' and 'Indian Polar Endeavours'.



- Dr VS Prasad, Head, NCMRWF, was elected Fellow of India Meteorological Society 2024.
- Rahul Mohan, Dr NCPOR, received prestigious L the Rama Birth Rao Centenary Award during the Annual General Meeting of the Geological Society of India on November 27, 2024, his significant for



contributions to the diverse microfossil groups and for their applications for the year 2024.

Dr Kamaljit Ray, Scientist-G, MoES, was conferred the prestigious India Meteorological Society Fellowship 2024.



- Dr Thara Prabhakaran, Scientist-G, IITM, was conferred the prestigious India Meteorological Society Fellowship 2024.
- Dr A P Singh, NCS, received the 'Anni Talwani Gold Medal' by the Indian Geophysical Union for 2024.
- Dr Susmitha Joseph and Dr Bhupendra Singh were honoured as IMS Associate Fellows.
- Ms Mercy Varghese received the IMS Best Paper in Monsoon Research (formerly the B N Desai Award).
- Mr Avinash N Parde received the IMS Best Paper on Weather and Climate Services (formerly Bhavanarayana Award).



# **Collaborations (MoUs and MoAs)**

• IMD signed an MoU with the Ministry of Rural Development on October 30, 2024, to enhance rural livelihoods by disseminating weather and climate information with agro-meteorological advisories.

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• NCPOR signed an MoU with the Emirates Polar Mission Steering Committee/International Affairs Office on December 13, 2024, to collaborate in Polar Research Collaboration.



• NIOT signed an MoU with the Harbour Engineering Department, Government of Kerala, on December 16, 2024, to collaborate on key projects focused on Coastal Inlet Management, Coastal Protection and the design of Ports and Harbours.



• NIOT signed an MoA with Pondicherry University on December 19, 2024, to conduct an MSc Marine

Biology course under the Deep Ocean Mission Vertical 6 (Advanced Marine Station for Ocean Biology).



- IMD signed an MoU with the Department of Physics, Tripura University on December 24, 2024, to expand the indigenously developed lightning detection system, the Indian Lightning Detection Network.
- NCESS collaborated with the Kerala State Science and Technology Museum and Priyadarsini Planetarium to set up the Automatic Weather Station (AWS) Data Display system.
- NIOT signed a Tripartite License agreement with M/S Livelihood Alternatives Pvt Ltd, Odisha and National Research Development Organisation, New Delhi, for Saline Water Lantern (ROSHINI) Technology.



 NCPOR and the Creative Museum Designers (CMD)– National Council of Science Museums (NCSM) signed an MoA to establish the Globe Theatre: Science On a Sphere, to transform educational experience, offering a unique way to explore and understand the Earth's polar and oceanic environments.



CMLRE has signed an Agreement with the National Institute of Water and Atmosphere (NIWA) New Zealand to conduct joint studies on biodiversity-related works in the Southern Ocean. Under this agreement, CMLRE will undertake a voyage onboard FORV Tangaroa in the Ross Sea region of the Southern Ocean in Antarctica from January to February 2025.

# **New to Science**

• NIOT moored data buoys provided the critical real-time information of marine environment during the passage of the Cyclonic Storm FENGAL during November 26-December 01, 2024. The coastal buoy deployed off Chennai triggered high frequency transmission and recorded low pressure of 996.8 mb, wave height of 4.5 m and wind speed of 55 km/hr with wind gusting upto 87 km/hr.



 CLMRE developed an ultra-low temperature systematic sample storage facility (BIO-BANK) and initiated the addition of samples (including tissue preserved in ethanol, water and sediment samples). The facility will continuously provide deepsea resources for future genomic and bioprospecting works. CLMRE reported two rarely known tintinnid ciliates, Wangiella dicollaria Nie, 1934 and Stenosemella parvicollis (Marshall, 1934) Hada, 1935 for the first time from the neritic waters of the Eastern Arabian Sea.



CMLRE conducted an experimental study on the natural light-driven plastic leaching effects on the carbon chemistry in the tropical coastal waters of the eastern Arabian Sea. This revealed an impact on coastal water chemistry, causing significant pH reductions (0.38 units) and releasing 15–75 MT of dissolved organic carbon annually, and underscored the need to study plastic pollution's role in coastal ocean acidification.

## What's New!

- The IMD 150th Foundation Day celebrations through a slew of activities, including workshops, national exhibition, marathon, and an olympiad, shall be concluded on January 14, 2025.
- The 12th Indian Southern Ocean Expedition will launch in January/February 2025. The consignment of the expedition is currently on its way to Mauritius.
- The 8th International Workshop on Monsoons is being organised at IITM Pune during March 17 to 21, 2025.

# **Know More**

Knowledge resources subscribed by MoES for its officials and staff can be accessed 24/7 at www.moeskrc.remotexs.in/user/login



# **Research Highlights**

The MoES publication list (October-December 2024), featuring peer-reviewed academic papers in high-impact international journals, is compiled from Web of Science (Clarivate) and Scopus (Elsevier) and can be accessed here.



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