Year-End Review

Exploring Extremes: A Landmark Year of Discoveries by India’s Ministry of Earth Sciences

Posted On: 23 DEC 2025 7:51PM by PIB Delhi

It has been a year of "firsts" for Indian science. From the successful trial of a deep-sea mining system at a staggering depth of 5,270 meters to the launch of a revolutionary weather mission, the Ministry of Earth Sciences (MoES) has spent 2025 turning ambitious blueprints into reality.

As the year draws to a close, the Ministry’s latest report shows more than just technical milestones—it highlights a direct impact on the lives of millions.

The Human Impact: Science that Pays Back

For the first time, a third-party audit has quantified the value of India's meteorological investments. While the government spent roughly ₹1,000 crore on the Monsoon Mission and high-performance computing, the return has been a massive ₹50,000 crore in economic benefits. These gains directly supported nearly 11 million families living below the poverty line, specifically small-scale farmers and fisherfolk who rely on the Ministry’s daily weather and ocean alerts to protect their livelihoods.

Breaking Records in the Deep & Dark

India’s quest for resource self-reliance reached the ocean floor this year.

Deep Sea Mining: India became a global leader in deep-sea technology by successfully testing a mining system at 5,270 meters—the deepest such test ever recorded.

The "Samudrayaan" Mission: The human submersible MATSYA cpassed its comfort and stability tests with flying colors. In a separate historic dive, Indian scientists reached depths of 5,002 meters during a collaborative mission in the Atlantic, a new benchmark for Indian oceanography.

Protecting Our Coasts and Islands

The Ministry isn't just looking at the horizon; it’s looking at our shores.

Clean Water for Lakshadweep: Three new eco-friendly desalination plants were commissioned, bringing fresh drinking water to the islands.

Coastal Guardians: Two new research vessels, Sagar Tara and Sagar Anveshika, were built right here in India under the ‘Make in India’ initiative to monitor our ocean health.

Safety First: The Tsunami Early Warning Centre monitored 32 major earthquakes this year, ensuring that not a single threat to Indian shores went unnoticed.

A Vision for the Next Century

On January 14, Prime Minister Sri Narendra Modi set the tone for the future by launching Mission Mausam and the IMD Vision 2047. To support these goals, the Ministry boosted its supercomputing power to 21 PFlops, making India's weather forecasts among the most high-resolution in the world.

Protecting Our Coasts, Powering Our Future

We're bringing science out of the lab and straight to our 7,500km coastline! Here's how:

Fresh Water: 3 new eco-friendly desalination plants in Lakshadweep are providing safe drinking water using local energy.

Homegrown Tech: Our new 'Make in India' vessels, Sagar Tara and Sagar Anveshika, are officially on the move, monitoring ocean health.

24/7 Safety: Our Tsunami Early Warning Centre tracked 32 major earthquakes this year to keep coastal communities safe.

The Future is Here: Under #MissionMausam and #IMDVision2047, we've boosted our supercomputing power to 21 PFlops.This means faster, more accurate weather updates for every citizen, powered by world-class Indian research.

"2025 was the year we proved that high-end science isn't just for textbooks—it's for the people," said Dr. M. Ravichandran, Secretary, MoES. "Whether it's a farmer in Vidarbha checking a rain alert or a researcher studying the Arctic ice, our work is about making India more resilient and self-reliant"

Some Important Events, Inventions & Schemes of MoES in 2025

- Hon'ble Vice President inaugurated a 1.5 lakh litre Low-Temperature Thermal Desalination (LTTD) plant set up by NIOT at Chetlat (Lakshadweep) on January 17, 2025.
- Hon'ble Minister of Earth Sciences Dr. Jitendra Singh, dedicated the Acoustic Test Facility as a designated Laboratory in Underwater Acoustics in India on April 12, 2025.

  · Hon'ble Minister of Earth Sciences Dr. Jitendra Singh released the platform *SAHAV*,developed by NCCR during the United Nations (UN) Ocean Conference-3, where it was presented as a global model for technology-enabled ocean governance.

  · Hon'ble Minister of Earth Sciences (HMoES) Dr. Jitendra Singh inaugurated Doppler Weather Radars (DWR) at Raipur and Mangalore, on 27th November 2025.

- Hon'ble Minister of Earth Sciences Dr. Jitendra Singh inaugurated NCPOR's new state-of-the-art facilities—Polar Bhavan, Science on Sphere (SOS), and Sagar Bhavan—in the presence of Secretary, MoES. Polar Bhavan (11,378 sqm; ₹55 Cr) houses advanced labs, a dynamic Earth-visualization system (an educational tool) forming Phase-I of South Asia's first Polar and Ocean Museum; Sagar Bhavan (1,772 sqm; ₹13 Cr) includes specialized ice labs and cleanroom facilities on 22 May 2025.

  · Secretary MoES Dr.M.Ravichandran, inaugurated the Moored Buoy Sensor Calibration Test Facility on February 11, 2025, at NIOT, which is the first institute to establish a conductivity and temperature sensor calibration facility in India.

· Secretary MoES Dr. M.Ravichandran, launched the sea trial demonstration of a 10m diameter open sea submerged cage with a sub-sea feeder system and an Artificial Intelligence / Machine Learning (AI/ML) based fish biomass system, along with a surveillance system, and deployed it at the North Bay of Andaman on April 17, 2025.

· Secretary, MoES, Dr.M.Ravichandran, inaugurated the Quadrupole Inductively Coupled Plasma Mass Spectrometer (Q-ICP-MS) Laboratory at NCESS on October 30, 2025. The facility enables precise geochemical and elemental analysis of geological samples.

- Secretary MoES, Dr. M. Ravichandran, inaugurated Open Science Sessions in the4th National Conference on Polar Science in September 2025, organised by NCPOR, engaging 265 participants across eight themes, including 160 young researchers, keynote sessions, and awards, reaffirming India's growing leadership in polar science.
- MoES co-organized India International Science Festival (IISF) during 6-9th December,2025 at Panchkula, Haryana.
- MoES, in collaboration with the Directorate General of Hydrocarbons, conducted multi-channel seismic data acquisition through Oil and Natural Gas Corporation (ONGC) in the northern Western Offshore Region. ONGC completed initial data processing to support India's revised Extended Continental Shelf submissions.

  · MOES developed Heat Action Plans in collaboration with NDMA and state governments to reduce heat-related mortality and morbidity in the country.

  · The High-Performance Computing (HPC) facility was augmented to about 21 PFlops to provide world class weather and climate services, by high resolution weather and coupled climate modelling.

- Urban Environment-Science to Society(UES25) a product is launched by the Secretary of MoES Dr M.Ravichandran & Sri M.Krishan, Secretary, Ministry of Electronics & Information Technology) Meity, on 15th December 2025, at the Ministry of Earth sciences, which is developed under the (National Supercomputing Mission) NSM urban Modelling project, that is funded by Meity, Govt.of India. This platform serves as an integrated framework for weather, air quality and urban flood information, empowering operational agencies, Municipal Corporations, researchers and disaster management authorities.
- 4th Deep Ocean Council meeting, under the Deep Ocean Mission has inaugurated & conducted by the Secretary of MoES, Dr M.Ravichandran on 17th December 2025 at the Ministry of Earth sciences, in the meeting several verticals of the mission were discussed like that-Deep sea mining & manned submersible, ocean climate change advisory services, exploration & conservation of deep sea bio-diversity, deep ocean survey and exploration, energy and fresh water from the ocean and advanced marine station for ocean biology.
- The Earth System Science Organisation(ESSO) Review meeting has hosted by the Ministry of earth Sciences, at Shillong, Meghalay on 19th December 2025 under the chairmanship of the Secretary of MoES, Dr.M.Ravichandran. In the program DG of Meteorology Dr. Mrutunjay Mohapatra and Heads and Directors of MoES institutions were attended. In the meeting several focused points were discussed- like strengthening inter institutional collaboration, identifying scientific & technological gaps & aligning ESSO's roadmap with India's Vision 2047 across weather, climate, ocean and Earth System Sciences .

- 9th National Lighting conference has been organised at the Ministry of Earth Sciences, on 22nd December 2025, this was hosted by the jointly by these aligned institutions MOES-NDMA-IMD-CROPC. In the event the focal theme was --“challenge of building resilience of vulnerable communities against rising surge in atmospheric electricity, its relation to extreme weather events and citizen science”. In the program Secretary of MoES, Dr.M Ravichandran & D.G of IMD Dr Mrutunjay Mohapatra and other dignitaries were also present there.

***

NKR/JKP