December 2025

NEWSLETTER

THE LATEST NEWS AND UPDATES FROM MEER

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Welcome to December edition of the MEER Newsletter

As 2025 draws to a close, we're pleased to share the latest progress from our work across Africa, India, and beyond. This month's update covers key developments in our field trials, partnerships, and community-led cooling initiatives as we prepare for an even more ambitious year ahead.

Across Africa, our collaborations with community groups continue to deepen, helping us lay the groundwork for broader experiments and expanded field sites in early 2026. In India, ongoing rooftop trials in informal settlements are already delivering promising results, offering valuable insights that are shaping the next phase of testing and regional engagement.

This edition highlights these updates along with recent events, team news, and the latest scientific communications from MEER. We're excited to share the momentum building across our programmes and the important steps underway as we enter the new year.

NEWS FROM AFRICA

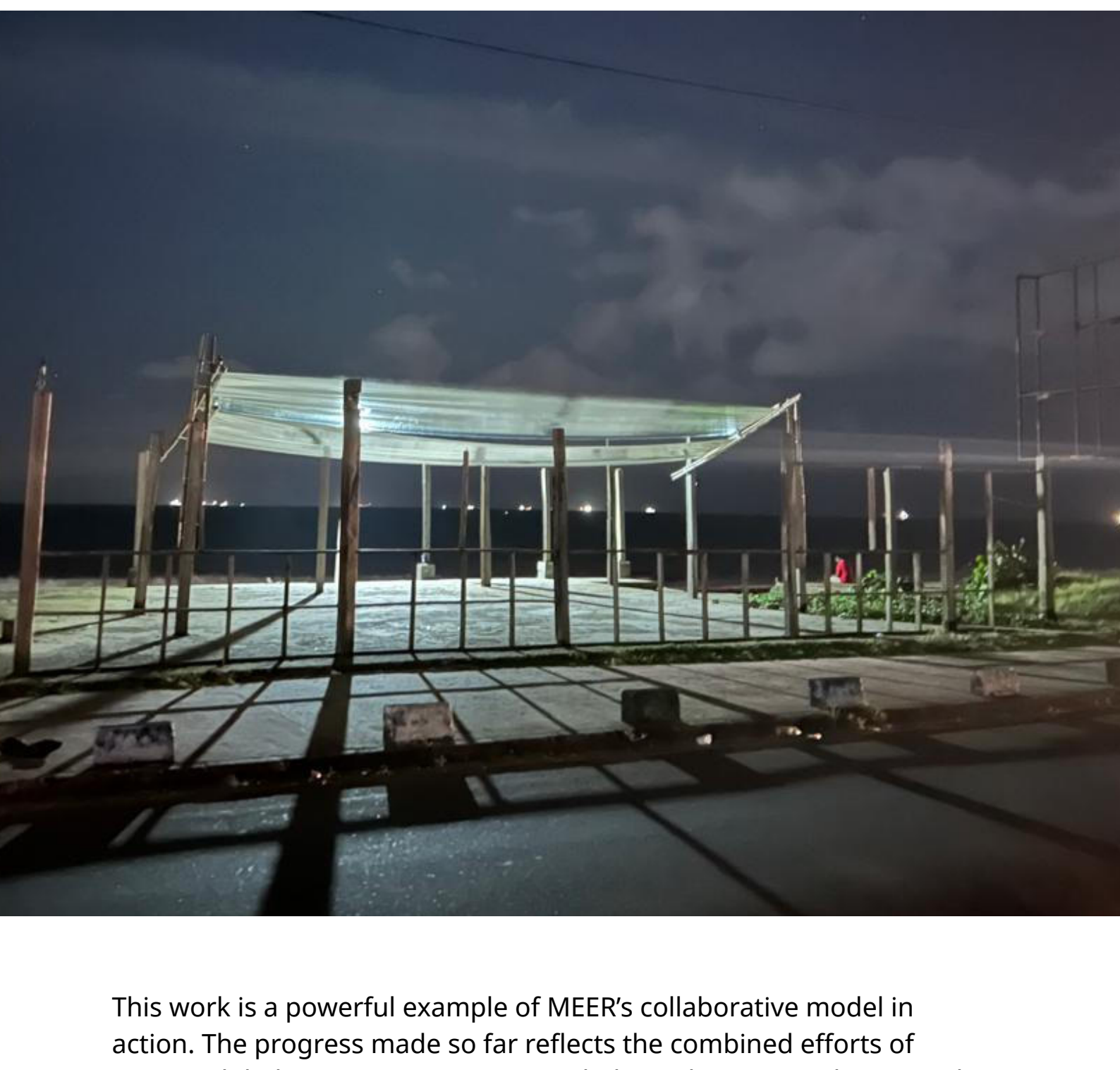
Developing Our New Cooling Canopy System

The team in Africa has been making remarkable progress over the past month on one of MEER's most promising new innovations — a modular cooling canopy system designed to create safer, cooler, and more comfortable working environments for our fabrication teams. As climate extremes intensify across West Africa, the ability to work outdoors in severe heat is becoming increasingly complex. This new canopy system is part of MEER's effort to develop practical, low-cost solutions that help communities adapt immediately.

Development of the system has been underway at our beachfront engineering site in Freetown. The location has given us the perfect natural testing ground, exposing the prototype to strong coastal winds, heavy sun, and fast-changing weather. These real-world conditions are helping us refine the canopy so it remains stable, cool, and durable over time. The structure is built at a comfortable working height and uses sustainable, locally accessible materials — including bamboo, recycled or upcycled plastic components, and a lightweight reflective film — keeping the design practical, repairable, and easy to assemble by community-led teams.

Our first full installation is planned for the grounds of the Sierra Leone National Dance Troupe, where MEER is setting up a dedicated fabrication area. This site will serve as a central hub for producing our reflective components, clamp systems, and other materials required for climate-adaptation projects across the region. The canopy will allow our teams to work outdoors for longer hours, with far less heat stress, and with a higher level of comfort and safety.

What makes this system especially exciting is its broader potential. The same canopy design could be used far beyond fabrication sites. In agricultural settings, it could provide vital shade for farmers working long hours in the sun, protect seedlings from heat damage, and offer cooler areas for livestock or food-processing activities. In urban areas, similar structures could support community cooling hubs, shaded walkways, and gathering spaces where extreme heat has become a growing daily challenge. Because the system is lightweight, easy to transport, and simple to assemble, it can be deployed quickly wherever relief from heat is most needed.



This work is a powerful example of MEER's collaborative model in action. The progress made so far reflects the combined efforts of MEER's global engineering team, our dedicated teams on the ground in Sierra Leone, and our valued community partners. Together, they are building a blueprint for climate adaptation that is rooted in local capability, global expertise, and shared commitment.

We look forward to sharing more updates early next year as the first canopy is installed, the fabrication site becomes fully operational, and this new system begins to support broader climate-resilience efforts across Sierra Leone.

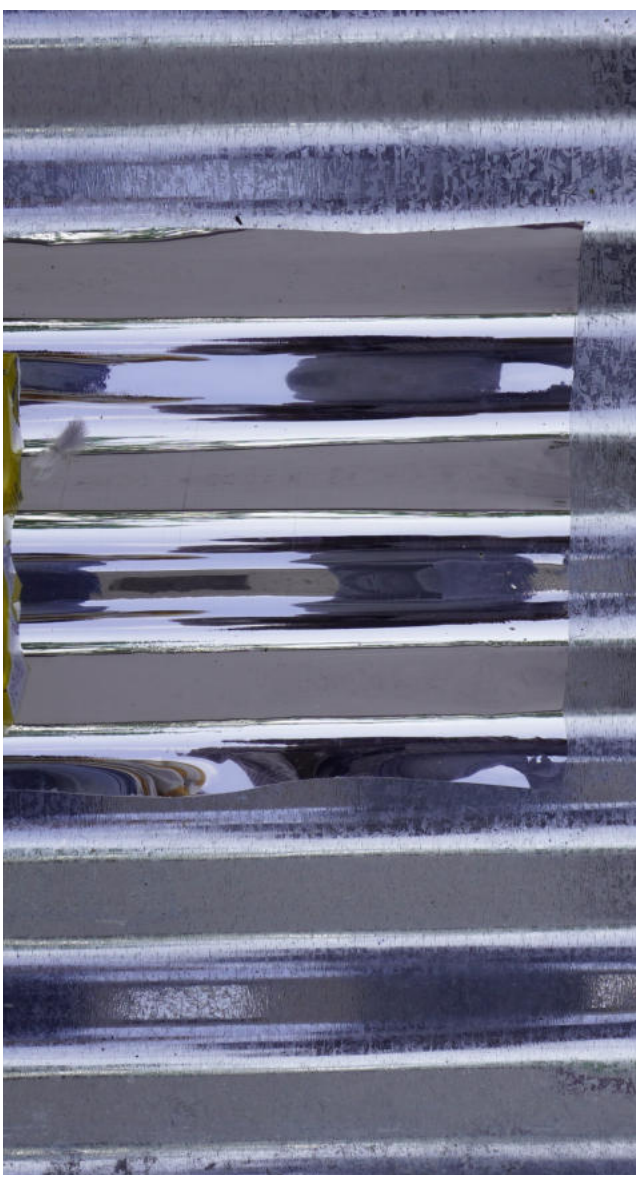
NEWS FROM INDIA

Testing Glues for MEER Sheets: India Team Innovates on the Roof

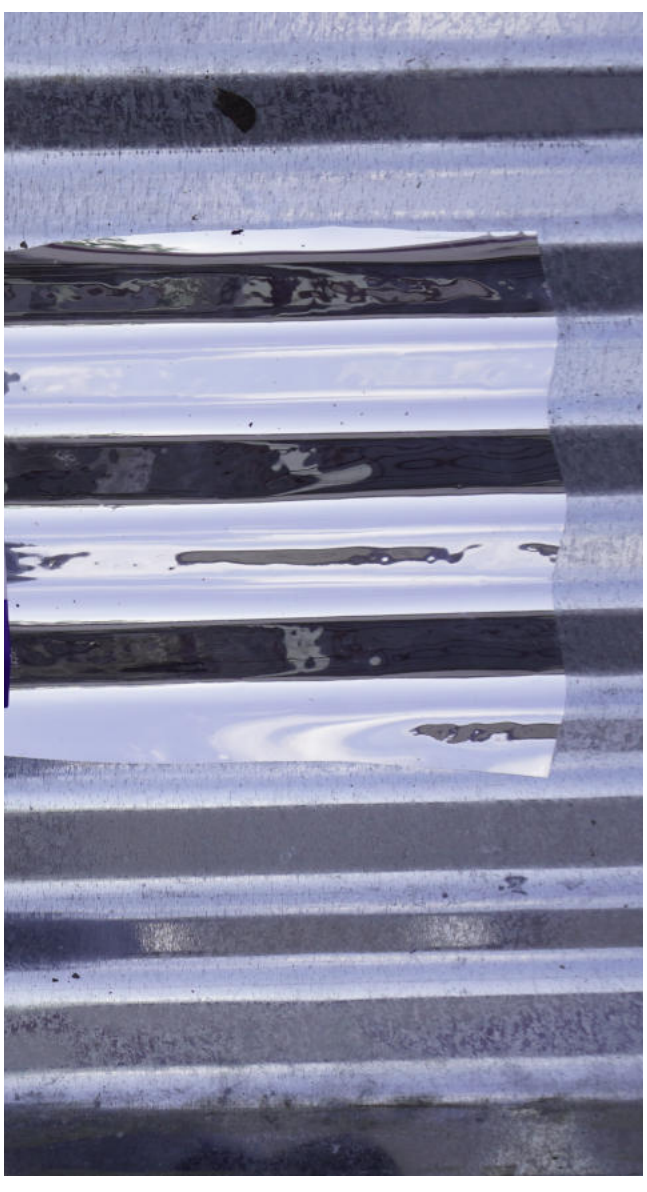
The India team recently carried out a rooftop experiment to evaluate how different adhesive approaches might help secure MEER reflective film to corrugated roofing in a safe, durable, and scalable way. The aim of this work is to identify bonding methods—ideally using simple, locally accessible or natural adhesives—that can support long-term installations in informal settlements, where many households face severe and recurring heat stress.

During the test, several adhesive samples were applied to small sections of reflective film mounted on a standard galvanized rooftop sheet. These samples were left to cure naturally under the intense rooftop conditions typical of urban India. Over the coming weeks, the team will monitor how each option performs when exposed to heat, dust, humidity, and daily temperature swings, focusing on which solutions remain stable, durable, and practical for community-level deployment.

This work forms an important part of MEER's broader effort to adapt cooling systems for the realities of low-income, high-heat neighbourhoods. Reflective surfaces can significantly reduce indoor temperatures, but their long-term impact depends on how reliably they can be attached to existing structures. Finding safe, affordable, and accessible adhesive solutions—particularly those that could be produced locally or derived from natural materials—will help ensure that MEER's cooling interventions can be installed easily by households and community teams.



Sample A



Sample B

The rooftop trial has been fully documented and will inform future guidelines for India and other regions where MEER is working. These small but essential tests help ensure that every component of MEER's system is optimised for the communities who need cooling most, enabling safer homes and improved resilience in places already experiencing dangerous levels of heat.

Reflecting the Future: Cooling Our Cities Without Carbon

In the aftermath of COP30 in Belém, one issue has only grown more urgent: how to cool a heating planet without making it hotter in the process.

By 2050, global demand for cooling is projected to triple as temperatures rise and cities expand. If this demand is met mainly through conventional air-conditioning, emissions from the cooling sector could double, driving massive electricity use and pushing climate goals even further out of reach.

Yet there is another path—one that doesn't rely on energy-hungry machines. Around the world, scientists, engineers, and community groups are turning to passive cooling: designs and materials that keep spaces cool by reflecting sunlight rather than absorbing it. Among the simplest and most effective approaches are cool roofs—surfaces engineered to reflect solar radiation and emit heat efficiently back to space. These surfaces can lower rooftop temperatures by 20–40°C and indoor temperatures by several degrees, often without a single watt of additional power.

This principle lies at the heart of MEER's reflective surface technology, which transforms rooftops, canopies, and community structures into passive cooling systems. Using durable PET–aluminum films and sustainable local materials such as bamboo and recycled composites, MEER's approach provides a low-cost, scalable alternative to conventional cooling—especially for vulnerable communities facing extreme heat.

At COP30, the UN's *Beat the Heat Implementation Drive*—launched by UNEP and the Cool Coalition—called for exactly this kind of innovation: cooling that is accessible, affordable, and zero-emission. Cool roof surfaces represent one of the fastest, cheapest ways to meet that goal, delivering immediate benefits in both comfort and energy savings.

In a world where billions could soon depend on cooling for survival, reflective roofs and surfaces are emerging not just as an architectural feature, but as a global public good.

As UNEP's Executive Director Inger Andersen put it, "We cannot air condition our way out of the heat crisis."

MEER's work shows that sometimes, *the brightest solutions are the ones that simply reflect the light away.*

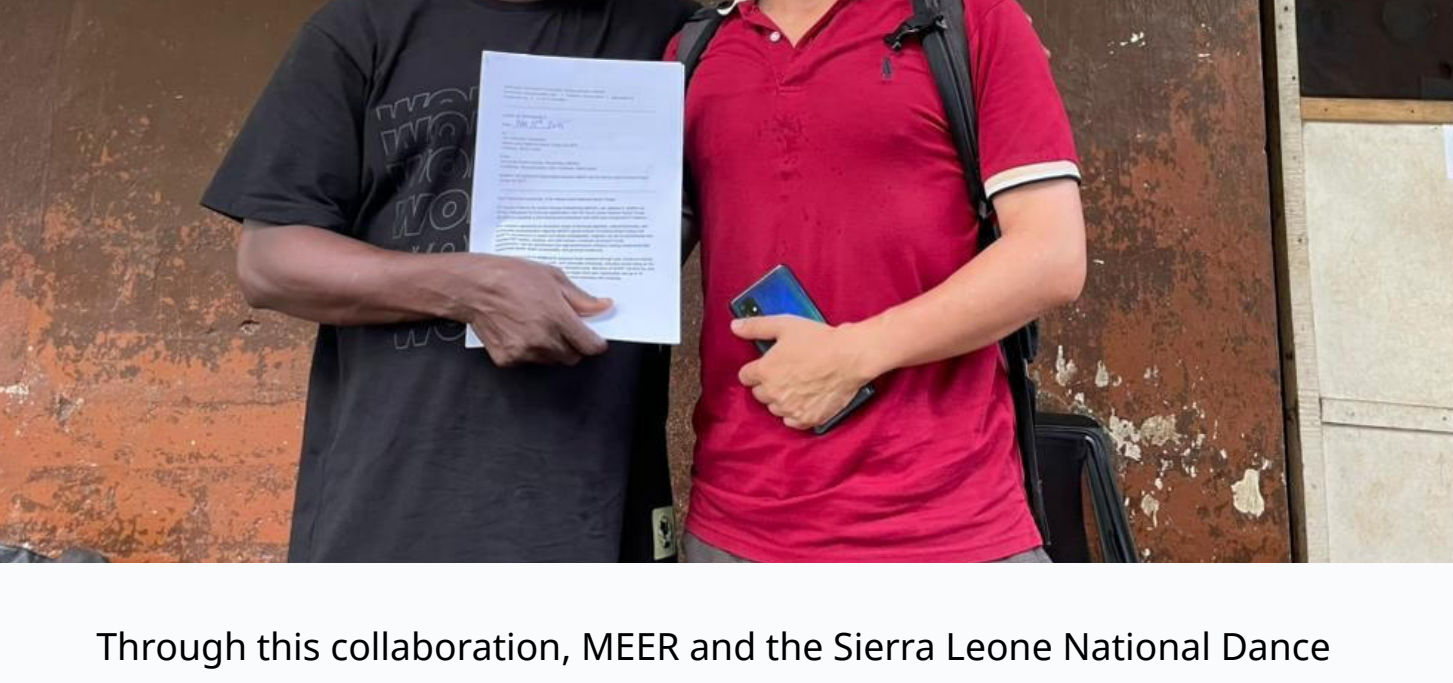
A MESSAGE FROM DR. YE TAO

Reflections and New Partnerships as the Year Draws to a Close

Hi everyone,

As we near the end of another extraordinary year, I want to take a moment to thank all of you for your ongoing commitment, creativity, and perseverance. Across continents, our shared work continues to grow — from research and field deployment to education, communication, and community engagement.

Through this collaboration, MEER and the Sierra Leone National Dance Troupe (SLNDT) will jointly develop local fabrication, training, and deployment of reflective cooling systems. The Dance Troupe's facilities and creative team will also play a central role in community outreach and storytelling, helping to communicate MEER's work through art, movement, and cultural expression.



These conversations and site visits reaffirm that while rigorous research is essential, the true measure of our work lies in its translation into meaningful relief for those most exposed to climate impacts. MEER's mission is not only to push the boundaries of science and engineering but also to ensure that these innovations directly serve communities on the frontlines.

This agreement is more than a formality — it's a step towards building locally rooted climate adaptation infrastructure. It reminds us that science and culture are not separate efforts; both are essential in shaping resilient, livable futures.

As 2025 comes to a close, I want to acknowledge the hard work of all our teams across Africa, Asia, and beyond. Every prototype, every conversation, and every act of collaboration adds to the foundation of a truly global movement.

Thank you for being part of this effort. Let's carry this energy into the new year with renewed determination and care for our shared planet.

Warm regards,
Dr. Ye Tao
Founder and Chief Scientist, MEER

CLIMATE NEWS

Global Warming Is Accelerating: A Call for Decisive Action

Source: *German Meteorological Society & German Physical Society*

The German Meteorological Society and the German Physical Society have issued a stark warning: if current trends continue, global warming could reach 3°C as early as 2050.

This comes alongside mounting evidence that the 1.5°C limit set in the Paris Agreement may already have been permanently breached, underscoring that climate change is not only ongoing but accelerating.

The Risks of Accelerated Warming

The societies' statement highlights grave consequences:

- **Agriculture under threat** – increasingly extreme weather patterns will make farming unpredictable or even impossible in many regions.
- **Habitability at risk** – some areas may exceed the limits of human survivability, driving mass displacement.
- **Life and health** – heat stress, water scarcity, and cascading crises could threaten billions worldwide.

The data indicate a non-linear warming trend, with research showing that the rate of heating over the past 30 years could accelerate further. If this trajectory continues, +3°C of global warming could arrive decades earlier than many models projected, setting the stage for multiple climate tipping points around 4°C. The societal and humanitarian toll could be catastrophic—up to 4 billion lives at risk.

The Call for Decisive Collective Action

The German scientific societies are urging immediate action:

Governments must recognize the accelerating risk of man-made global warming and act with urgency.

Hard discussions on adaptation are needed, including difficult questions such as whether to prepare for withdrawal from low-lying coastal regions on the North and Baltic Seas.

Global cooperation is essential to avoid the loss of control over the Earth's climate system.

As Özden Terli, meteorologist at ZDF, emphasized when sharing this call, the time for half measures is over.

What the Data Shows

Recent ECMWF ERA5 datasets—analyzed by Tuğberk Samur and informed by work from Grant Forster and Stefan Rahmstorf—illustrate the trajectory clearly. A trend line with an R^2 of 0.975 suggests that global warming may accelerate faster than linear projections predict.

The warning is sobering: the world is already on a trajectory that could break multiple tipping points well within this century.

A Closing Analogy

As one commentator noted: No one would put their family on an airplane that had even a 5% chance of crashing. Yet humanity is tolerating far higher risks with our global life-support system.

The message is clear: decisive, collective action is the only way to avert catastrophic outcomes.

MEERTalk

Dr. Jackie Kado

Executive Director of the Network of African Science Academies (NASAC)

Climate Change and Health in Africa:

Insights from a NASAC Publication

THURSDAY
DEC 4, 2025

11:00AM EST
4:00PM GMT

TO JOIN LIVE EVENT:
TINYURL.COM/MEERTALK

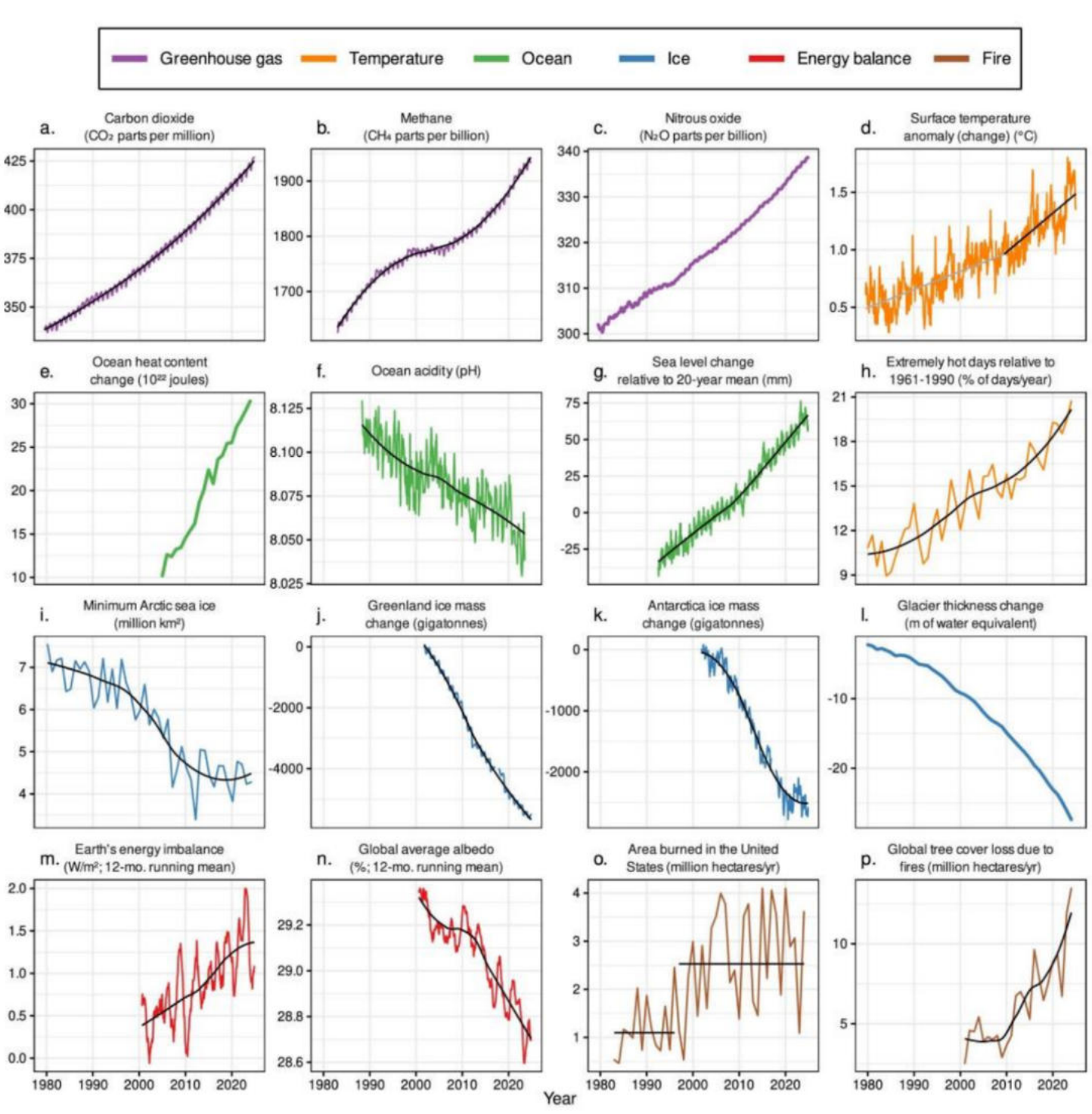
SCIENTIFIC REPORT

2025 State of the Climate: A Planet on the Brink

A new open-access paper published in *BioScience* delivers one of the clearest and most urgent assessments yet of the global climate emergency. *The 2025 State of the Climate Report: A Planet on the Brink* compiles the latest data across key Earth system indicators—and the picture it presents is stark.

The report confirms that 2024 recorded the highest mean global surface temperature ever measured, marking another sharp escalation in climate instability. In total, 22 of the planet's 34 vital signs are now at record extremes, from atmospheric CO_2 to ocean heat content, wildfire-driven tree loss, and ice-sheet decline. Several indicators suggest that global warming may be accelerating, potentially driven by a combination of reduced aerosol cooling, stronger cloud feedbacks, and a rapidly darkening planet.

The authors highlight the scale of ecological overshoot now underway. Human populations, livestock numbers, meat consumption, and global GDP all reached new highs last year—with an additional 1.3 million people and 0.5 million ruminants added every week. Fossil fuel use hit record levels across coal, oil, and gas, dwarfing the rise in solar and wind energy by a factor of 31. Meanwhile, atmospheric carbon dioxide surged further in early 2025, exacerbated by reduced land carbon uptake during El Niño and widespread forest fires.



The consequences are increasingly visible. Global fire-related tree cover loss is at its highest level on record, with tropical primary forest fires up 370% compared to 2023. Ocean heat content has climbed to new extremes, contributing to the largest coral bleaching event ever recorded —affecting an estimated 84% of the world's reef area. Both Greenland and Antarctic ice mass are at record lows, raising the possibility that critical ice sheets may be crossing irreversible tipping points and committing the world to metres of long-term sea-level rise.
Climate-related disasters are intensifying. Texas floods killed at least 135 people, California wildfires caused more than US$250 billion in damage, and climate-linked disasters since 2000 have inflicted over US$18 trillion globally. Wildlife is also under mounting pressure, with more than 3,500 species now threatened by climate impacts and new evidence emerging of climate-driven population collapses.

The report warns that the world may be heading toward a "hothouse Earth" trajectory—one shaped by accelerating warming, reinforcing feedback loops, and cascading tipping points. At the same time, it emphasises that effective solutions already exist. Protecting forests, scaling renewable energy, shifting toward plant-rich diets, and accelerating climate justice–focused mitigation strategies remain both feasible and cost-effective. Crucially, social tipping points—driven by persistent, organised non-violent movements—can still shift public norms and policy even in periods of political paralysis.

The authors call for systemic change that links technical interventions with broader societal transformation. This includes governance reform, resilient community planning, and coordinated action between institutions, policymakers, civil society, and grassroots movements.
The report is open access and freely available. We encourage all readers to explore it, share it widely, and use its findings to inform urgent climate action.

Read the full paper here

EVENT SPOTLIGHT:

Global Launch of the Earth Rover Program

World Soil Day — 5 December 2025

We're pleased to share an exciting event from our colleagues at the **Earth Rover Program**, a non-profit initiative developing groundbreaking, non-invasive methods to measure and map soil health using seismology, novel sensors, and AI. Their work promises to transform how we understand the ground beneath our feet — with major implications for global food security, climate resilience, and sustainable land management.

To mark World Soil Day, the Earth Rover team is hosting the global launch of their initiative and releasing their inaugural report, "Soilsmology: Transforming our Understanding of Soil." The report introduces an entirely new scientific concept — *soilsmology* — which brings seismology into the world of soil health monitoring, enabling rapid, accurate, and scalable assessment techniques developed with partners across the UK, Kenya, Colombia, and Europe.

The launch will feature a live panel discussion moderated by Earth Rover co-founder and *Guardian* columnist **George Monbiot.**

Event Details

FRIDAY, 5 DECEMBER 2025

14:00–15:00 GMT / 09:00–10:00 EST / 17:00–18:00 EAT

Online Event (Zoom Webinar)
Click here to sign up:

This event is open to the public and suitable for anyone interested in soil health, climate resilience, sustainable agriculture, or the future of environmental monitoring. Feel free to share this invitation widely.

MARTIN PALMER

The Nemesis of Planet A

ON THE

MEER

PODCAST

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Thank You for Being Part of Our Journey

As we reach the end of 2025, we want to sincerely thank every one of you for following our work, supporting our mission, and standing with the communities we serve. This year has been one of enormous growth, learning, and relationship-building — and none of it would have been possible without your continued engagement.

As we close out 2025, we are incredibly grateful for the progress made — and even more excited for what lies ahead. MEER's work has always been grounded in collaboration, science, and community experience, and 2026 will bring our most ambitious field trials and partnerships yet.

Thank you for being with us throughout this journey.

We look forward to sharing more with you in the New Year.