MAY 2026

NEWSLETTER

THE LATEST NEWS AND UPDATES FROM MEER

SUPPORT OUR WORK
meer.org

Welcome to the May 2026 edition of the MEER Newsletter

This month's newsletter reflects an important moment in MEER's journey: the movement from research and design into deeper field engagement, real-world testing, and community-centered climate adaptation.

In this edition, we share updates from documentary filming in Kroo Bay, a field visit by the Healthy Climate Initiative leadership to MEER's India site, early observations from heat and health data collection, and new insights into the future of radiative cooling coatings. We also explore how MEER's Surface Radiative Thermal Management approach fits into the wider climate conversation around heat, water, land, and resilience.

Together, these stories show the heart of MEER's work: combining science, engineering, and lived experience to create cooling solutions that are practical, scalable, and urgently needed.

NEWS FROM AFRICA

DOCUMENTARY FILMING IN FREETOWN

Over the last few weeks, MEER's work in Freetown became the focus of an international documentary film crew, who spent time with our team in Kroo Bay—one of the most heat-exposed and under-resourced communities in the city.

The crew documented multiple aspects of our on-the-ground operations. They followed fabrication teams as they assembled canopy components using locally available materials, capturing both the technical process and the increasing pace at which these systems are being developed.

Alongside this, they spent time within the community itself, observing how residents are coping with extreme heat conditions and the daily realities of heat stress in dense, low-infrastructure environments.

A central focus of the filming was MEER's surface radiative cooling canopy systems—a practical, rapidly deployable approach to reducing heat exposure in public and residential spaces. The team captured early-stage installations, ongoing design refinements, and the broader effort to translate climate science into accessible, real-world solutions.

The documentary also followed MEER's founder and Chief Scientist, Dr. Ye Tao, documenting the research underpinning this work. This included field-based observations, early-stage data collection, and the continued development of MEER's surface radiative thermal management approach. The intention is to show not only the deployment of solutions, but the scientific process behind them—how ideas are tested, refined, and adapted in real-world conditions.

Equally important was the human story behind the work. The filmmakers spent time with several MEER team members, documenting their personal journeys. Some individuals have lived with long-term disabilities and historically had limited access to stable opportunities. Today, they are integral members of the team, contributing directly to the design and construction of climate adaptation systems for their own communities.

This reflects a core part of MEER's approach: not only deploying cooling solutions, but enabling participation, ownership, and opportunity within the communities most affected by climate change.

The documentary aims to capture this intersection—between climate science, engineering, and lived experience—and to tell a story that is both technically grounded and deeply human.

We're looking forward to seeing how the filmmakers bring this to life, and how the story of Kroo Bay can help communicate both the urgency and the potential of community-led climate adaptation.

NEWS FROM INDIA

Visit by Healthy Climate Initiative Leadership to MEER India Site

MEER recently hosted a site visit in India by **Dr. Soumitra Das (Founder)** and **Rituraj Phukan (Co-founder)** of the Healthy Climate Initiative, who visited ongoing field installations to gain a closer understanding of MEER's surface-based cooling work.

Accompanied by members of the MEER India team, the visit focused on observing reflective rooftop sheet installations in a real-world setting. The visitors were taken through the installation process, material application, and the practical challenges involved in deploying cooling interventions in heat-exposed communities.

During the visit, Dr. Das and Rituraj engaged in detailed discussions around key aspects of the intervention, including maintenance requirements, cost considerations, and long-term durability of the materials. The conversation reflected a strong interest in the scalability and operational practicality of such solutions, particularly in contexts where access to conventional cooling remains limited.

A key part of the visit involved interaction with **Rani**, a resident whose home has been fitted with the reflective roofing solution. Through this exchange, the visitors were able to gain first-hand insights into the lived experience of the intervention, including perceived changes in indoor comfort and usability during hot conditions.

The visit provided an opportunity for meaningful dialogue between organizations working on climate adaptation, highlighting the importance of field-based understanding alongside research and design. It also reinforced the role of low-cost, surface-based cooling approaches in addressing heat exposure at the household level.

Such engagements continue to support knowledge exchange and collaboration across initiatives working toward practical and scalable responses to extreme heat.

From Lab Performance to Real-World Durability: The Next Challenge in Radiative Cooling Coatings

A recent paper in Applied Energy highlights an important shift in passive daytime radiative cooling (PDRC) research—from achieving high performance in controlled settings to ensuring durability in real-world environments. While many coatings already demonstrate strong solar reflectance and thermal emissivity, their practical application has been limited by contamination, weathering, and mechanical degradation.

This study addresses that gap by developing a porous MgO/SiO_2 coating with "superamphiphobic" properties, meaning it repels both water and oils, allowing surfaces to remain clean and maintain performance over time.

The coating achieves around 95% solar reflectance and 96% emissivity, enabling sub-ambient cooling of up to 7.2°C under outdoor conditions, while also demonstrating strong resistance to abrasion, water impact, and environmental exposure. However, this progress also highlights an important trade-off in the field. Achieving this level of durability often requires more complex material systems, including specialised surface treatments and fluorinated compounds, which can increase cost and manufacturing complexity.

As a result, while these coatings represent a significant step forward in performance stability, questions remain around scalability and affordability at large deployment levels.

What this work makes clear is that the future of cooling technologies will depend on balancing three critical factors: performance, durability, and cost. Bridging these effectively will determine how widely such solutions can be deployed in real-world settings, particularly in regions most vulnerable to extreme heat.

Read the full paper

A MESSAGE FROM DR. YE TAO

Working in Real Heat: Early Data, Engineering Progress, and Human Impact

Over the past month here in Freetown, the heat has become increasingly difficult to ignore. What stands out is not just the peak daytime temperatures, but the persistence of heat throughout the day and into the night. Buildings absorb and retain this energy, creating environments where there is little relief even after sunset.

In practical terms, this means that for many of the people we are working alongside, heat exposure is constant. It is not an abstract climate metric — it is something that affects how people sleep, how children learn, and how communities function day to day.

Over the last several weeks, we have also had a documentary film team working closely with us on the ground. They have been capturing both the engineering work and the lived reality of these environments — the construction of systems, but also the conditions that make these interventions necessary. Their presence has helped document not only what we are building, but why this work is urgently needed.

From an engineering perspective, our work continues on the development of canopy systems, which remain an important part of our broader approach to cooling in public and community spaces. At the same time, we are increasingly focusing on highly reflective rooftop covering systems as a direct intervention for buildings where heat exposure is most severe.

Alongside this, we have begun preliminary data collection for our heat and health study. This marks an important step forward. While much of the global discussion around heat focuses on large-scale climate data, there is still a need for detailed, ground-level measurements of what people are actually experiencing.

Our initial observations have been centered in a school environment. Inside classrooms, we are recording temperatures in the range of 35–36°C (95-96 F), with humidity levels between 50–60%. These conditions create what can only be described as crushing heat. The combination of temperature and humidity significantly limits the body's ability to cool itself, and the impact on concentration, comfort, and overall wellbeing is immediately apparent.

Teachers are working in these conditions for extended periods, and students are expected to learn within them. Even short periods of exposure at these levels can be exhausting, and over the course of a full day, the cumulative effect is substantial.

In response to this, we are now preparing to deploy a highly reflective roof covering system at the school site. The objective is to directly reduce heat absorption at the building surface, preventing a significant portion of solar energy from entering the structure in the first place. Based on our previous installations and field experience, we anticipate noticeable reductions in indoor temperatures once this intervention is in place.

WATCH APRIL'S MEERTALK !

CLIMATE NEWS

The Hidden Limit to Cooling: Why "Green Water" Changes the Climate Equation — and How MEER's SRTM Approach Fits In

For decades, the global conversation on water scarcity has been dominated by what is visible. Rivers running low, reservoirs under pressure, groundwater being depleted — this is the visible system, known as blue water.

Most of the water that sustains life on land is not stored or extracted in this way. It exists in soils, in vegetation, and in the atmosphere, moving continuously through evaporation and transpiration. This is green water, and it underpins nearly all terrestrial production.When water evaporates, it removes heat from the surface. This process, evapotranspiration, is one of the Earth's primary cooling mechanisms over land. In effect, green water is not only a resource that supports life, but a system that manages heat
at planetary scale.

Unlike blue water, green water cannot be transported or expanded at will. It is constrained by rainfall, land availability, and ecological limits. Increasing its use inevitably involves trade-offs. Expanding agricultural production or biomass systems requires reallocating this invisible flow away from natural ecosystems, often resulting in deforestation, habitat loss, and declining biodiversity.

At the same time, many of the approaches used to manage rising temperatures rely on this same system. Relying on it alone to meet growing thermal stress introduces limits that are difficult to overcome.

It is within this context that MEER's work must be understood.At the core of MEER's approach is Surface Radiative Thermal Management, or SRTM. Rather than relying on water-based processes to remove heat after it has been absorbed, SRTM focuses on reducing the amount of heat that enters the system in the first place. By increasing the reflectivity of surfaces, a portion of incoming solar radiation is redirected before it can be converted into thermal energy.

Where evapotranspiration manages heat through water, SRTM manages heat through radiation. Where green water systems are constrained by land and rainfall, SRTM operates independently of those limits. It does not require additional water, does not compete with ecosystems for resources, and does not depend on biological processes to function.

In practical terms, this means that cooling can be delivered in a way that does not intensify competition between human and ecological needs. Lower surface temperatures can reduce evaporative demand, helping to retain moisture in soils and improving the efficiency of water use where vegetation is present. At the same time, communities can be protected from extreme heat without requiring additional irrigation or land-use change.

This is particularly relevant in regions where water scarcity, land constraints, and heat exposure intersect. In such environments, the ability to reduce temperature without increasing reliance on evapotranspiration is not simply beneficial, but necessary. Importantly, SRTM is not positioned as a replacement for natural systems. Evapotranspiration will remain essential to food production, ecosystem function, and climate stability. What SRTM offers is a way to reduce the burden placed on that system.

The broader implication is that addressing extreme heat requires more than a single approach. The Earth's energy balance, water systems, and land use are deeply interconnected. As the limits of one pathway become clearer, the need for complementary approaches becomes more apparent.

Surface Radiative Thermal Management sits within this emerging understanding. It is not an abstract concept, but the central scientific framework through which MEER's work connects community cooling, climate resilience, and global impact. The question is no longer only how to manage water more efficiently, but how to manage heat within the limits of a finite system.

SRTM offers one part of that answer.

MEERTalk

Phoebe Barnard

Global Change Scientist & Professor

At the Crossroads of Civilization:

Science, Society, Wars and Personal Choice

SUNDAY
MAY 3, 2026

11:00 AM EDT
4:00 PM BST

REGISTER HERE:
TINYURL.COM/MEERTALK

ANASTASSIA MAKARIEVA

Forests as the Beating Heart: The Biotic Pump Theory

ON THE

MEER

PODCAST

LISTEN NOW

Thank You for Being Part of Our Journey

We want to extend our sincere thanks to everyone who continues to support, follow, and engage with MEER's work.

This month has highlighted the many layers of our mission — from field installations and community conversations to scientific research, documentary storytelling, and early heat-health data collection. Each step helps us better understand how extreme heat is affecting people in real conditions, and how practical cooling solutions can be designed, tested, and scaled responsibly.

Your support allows MEER to keep moving from ideas into action, and from action into measurable impact. As we continue this work across communities, schools, rooftops, and public spaces, we remain deeply grateful for the trust, encouragement, and collaboration that make this journey possible.

Thank you for being part of MEER's mission to cool the planet and protect the communities most exposed to rising heat.