Written testimony of Thomas Cavett
House Committee on Science Space and Technology
Subcommittee on the Environment
Hearing "*Protecting Lives and Property: Harnessing Innovative Technologies to Enhance Weather Forecasting*"
July 16, 2025

Good morning. Chairman Franklin, Ranking Member Amo, members of the committee, thank you for inviting me to testify before you today. It is an honor to be here as a representative of the commercial weather industry to discuss emerging technologies that enhance weather forecasting.

My name is Thomas Cavett, and I serve as a senior leader at Tomorrow.io, where I lead government strategy and business development in North America. I bring over a decade of experience working at the intersection of technology, infrastructure resilience, and national security. I am also a member of the Department of Commerce's Environmental Technologies Trade Advisory Committee and a veteran, having served as a Green Beret in US Army Special Forces. I am also the founder of the Commercial Weather Alliance, an informal coalition of commercial weather companies united around a common purpose - to increase the collaboration and public private partnership between the US Federal weather enterprise and US weather industry.

In my current role, I lead strategic partnerships that deliver cutting-edge weather and climate capabilities to the U.S. government, with a particular focus on supporting mission-critical operations across NOAA, NASA, and the Department of Defense. These agencies are key stakeholders and essential collaborators in shaping the future of weather forecasting. Our work ensures that public agencies have access to the most advanced, responsive, and cost-effective weather solutions available, whether it's supporting NOAA's mission to protect life and property, enabling all-weather operational readiness for the military, or contributing to NASA's science objectives. These public-private partnerships are central to our mission and represent the kind of collaboration that drives both innovation and impact on a national scale.

Tomorrow.io's mission is to equip governments, industries, and individuals with advanced weather intelligence to make faster, more informed decisions in the face of weather-driven challenges. We are an American weather technology company with offices in Massachusetts, Colorado, and abroad, building solutions across the entire forecasting value chain—from proprietary space-based observations and AI-driven forecast models to real-time, operational decision-support platforms.

While we are proud to operate a first-of-its-kind commercial weather satellite constellation, our work extends far beyond space. Artificial intelligence and machine learning are embedded throughout our systems, powering everything from dynamic satellite tasking over severe weather regions to deep learning models that enhance forecast accuracy while reducing computational demands. Our AI-enabled platform translates complex atmospheric data into mission-critical insights, supporting decisions such as rerouting fleets, suspending operations, or issuing early warnings. Unlike traditional providers who rely solely on government-generated

data, Tomorrow.io vertically integrates the entire weather intelligence stack, augmenting and accelerating national capabilities in a way that is collaborative, scalable, and future-ready.

The signals to private industry created by the Weather Act of 2017 were pivotal in galvanizing a new commercial weather industry and fueling Tomorrow.io's growth. This policy vision sparked a turning point in our industry. Thanks to the committee's foresight, Tomorrow.io has raised over $300M since its founding in 2016 and has grown from a software startup into a full-stack weather intelligence provider with customers ranging from NOAA and NASA to the U.S. Air Force and global Fortune 500 companies across sectors such as commercial airlines, insurance providers, electric utility providers, rail operators, agriculture, and more. Our partnerships span federal, state, and local governments both domestically and internationally. We're proud to be the chief architect for NOAA's EPIC program, bringing NOAA's weather models into the cloud. We also collaborate with key entities like Washington D.C. MTA, New York City Emergency Management, and the Penn Turnpike, helping countless state and local agencies achieve more efficient operations, improved safety, and scalable decision-making.

Tomorrow.io is already delivering measurable impact across the U.S. economy - helping agriculture suppliers reroute grain and fertilizer shipments to maintain critical agricultural supply chains, providing critical decision support to specialty pharmaceutical companies delivering life-saving, temperature sensitive medicine, to saving airlines tens of thousands of dollars per hub each month by avoiding unnecessary weather delays. From supporting real-time decisions for electric utility providers to mitigate weather impacts to power grids, to boosting game-day sales for professional sports teams and keeping live broadcasts on track, Tomorrow.io's weather intelligence is transforming operations, reducing risk, and unlocking value across the US economy and globally.

We believe that tomorrow's weather challenges—whether in defense operations, transportation, or managing the electrical grid—require faster, more adaptive, and more scalable solutions than legacy systems alone can deliver. Across the industry, including at Tomorrow.io, we see significant opportunity for innovation throughout the entire weather value chain: from next-generation space-based observations to improved data assimilation and modeling, to AI-driven tools that translate forecasts into real-time operational decisions. Our investments reflect this full-spectrum approach, not just at the last mile, but across every layer of the technology stack. The goal is not to replace, but to enhance and complement existing systems with faster deployment cycles, tailored applications, and greater resilience to meet the evolving needs of government and commercial users alike.

Barriers to entry in the weather and space industries are lower than ever before. Launch costs have plummeted thanks to commercial launch providers, making it economically viable for private companies to deploy constellations once reserved for government agencies. Once, only

governments could afford to launch satellites, and even they dreamed of reusable rockets to cut launch costs. But it was private innovation and risk capital that turned that dream into reality, with companies proving that this once 'pie in the sky' concept can be made to work, and work well. Crucially, they succeeded by leaning on the government as their first anchor customer. That shift unlocked entire commercial satellite industries, from Earth observation to global broadband, once reserved for state budgets alone.

We're now doing for weather what SpaceX did for launch: leveraging private capital, innovative tech, and government as an anchor buyer to make world-class weather intelligence affordable, scalable, and commercially viable for the first time. At the same time, the rise of low-cost, high-performance small satellites has made it possible to collect high-quality data without the massive budgets or timelines of traditional systems. These advances are further amplified by the availability of scalable cloud computing and the rapid evolution of artificial intelligence models and software. Together, these technologies have democratized access to space and supercharged innovation, allowing commercial firms to design, launch, and operate weather missions faster, cheaper, and more effectively than ever before. The success of commercial innovation in other space domains (See Figure 1), such as manned space flight, space domain awareness, and lunar landing, demonstrates how private capital and industry expertise can lead to significant cost savings and national capability multiplication, a proven path we aim to replicate for weather forecasting. These shifts have enabled Tomorrow.io to deploy far more systems, improving global observations and updating technology more frequently, all while achieving comparable data quality and performance at a fraction of the cost of government-owned systems (see Figure 2 and Figure 3).

The commercial sector is uniquely positioned to fill persistent observational gaps with new sensor technologies, take on high-risk, high-reward technical innovation, and attract significant private capital that reduces government up-front costs. Moreover, commercial solutions are often dual-use by design, enabling broader applicability across civilian and defense missions, and they evolve on faster timelines than traditional government systems. Companies like Tomorrow.io are able to raise capital and provide value to the commercial market faster than government appropriations cycles.

Furthermore, while there may have been concerns about the stability of commercial providers in the early days of these pilot programs, companies like Tomorrow.io are not dependent on government contracts, having firmly established their own commercial markets and thus inspiring confidence in the long-term reliability of their data.

The Weather Act of 2017 directed NOAA to transform its approach to the commercial weather industry. In the private sector, American companies and investors reacted to the demand signals and pushed innovation, driving economic benefit in new directions. Over the last few years,

many of the authorizations from the Weather Act of 2017 have expired or are in desperate need of updating as industry has grown beyond anything imagined at the time.

To that end, we strongly support the Committee's tireless efforts to reauthorize the Weather Act and urge the House and Senate to pass the bipartisan bill this year. We believe the bill's provisions that support the commercial weather enterprise are absolutely critical. Many new or expanded initiatives throughout the bill, especially under the Commercial Data title, should effectively direct NOAA to tap into existing commercial solutions.

It is especially worth noting the direction to move beyond evaluating commercial capabilities to be more operationally focused, fill gaps in NOAA's observing system architecture, protect acquired private sector data through redistribution contract permissions, and improve the forecast for specific atmospheric phenomena like hurricanes and atmospheric rivers. Industry is ready to meet the country's extreme weather challenges but needs the demand signal that Congress will be there to help drive NOAA and the entire Federal government to seek out modern, innovative and cost-effective solutions.

Weather is not just an economic and public health concern—it is also a critical national security issue. Weather intelligence is essential for the Department of Defense and for warfighters who are impacted by weather across the full spectrum of military operations. DOD operates in many regions with limited observing infrastructure, where government satellites alone cannot provide the revisit rates needed for timely, mission-critical decisions. Accurate forecasts across ground, air, and sea domains directly impact training, readiness, and operational success.

Commercial weather data can help close these gaps. From tactical planning to strategic initiatives like Golden Dome, improved environmental awareness should be a core enabler of multi-domain operations—not a constraint. Just like at NOAA, the Air Force's Commercial Weather Data Pilot (CWDP) has delivered novel, valuable datasets for nearly a decade. But as it transitions to the Space Force, it needs formal designation as a program of record and a dedicated budget line. Continued Congressional support is essential to sustain and scale this innovation for the future warfighter.

Programs like the NOAA Commercial Weather Data Pilot, the Air Force Weather Service's Commercial Weather Data Pilot, and NASA's Commercial Satellite Data Acquisition Program are distinct and each successfully demonstrates how the government can save taxpayer dollars by taking advantage of private-sector innovation. These efforts have laid important groundwork, but they can go further.

To truly leverage the speed and agility of the private sector, the government should seek to further augment its owned and operated systems by more formally incorporating commercial data into programs of record, much as other mission-critical capabilities (such as satellite

imagery and space launch) were once the exclusive domain of government but have now benefited from greater participation of the private sector.

With these advancements over the last decade and the future potential, after the Weather Act of 2025 is passed, NOAA can maintain assets in space but could primarily shift to a commercially owned, commercially operated model where the agency manages data flows and forecast outputs for the public good. This radical new approach would free up additional resources, ultimately protecting lives and property, and saving taxpayer money.

Increasing authorized funding levels and ultimately increasing the appropriated funds for critical programs like the CDP and improving authorizations across the agency for programs to access commercial solutions will drastically improve their likelihood of success. By expanding and accelerating these acquisition pathways, agencies can unlock more agile, cost-effective, and resilient capabilities—while keeping the U.S. at the forefront of global weather leadership.

By tapping into existing private sector innovation, the U.S. Government can escape the multi-decadal cycle of overly complex, cost-plus weather missions that have seen increasing budgets without proportional gains in performance. Despite outspending Europe, U.S. weather forecasting skills lag the European models. This committee is likely aware that the United States weather forecasts are often outperformed by other hydrometeorological agencies around the world. While Europe, the UK, Canada, Japan, and China operate sophisticated weather satellites and high-performance modeling systems, the U.S. struggles to keep up despite outspending its peers. NOAA invests nearly as much as all other countries combined, yet its forecasting accuracy consistently trails behind the EU and other global leaders. Furthermore, the U.S. relies on international partners for most OCONUS data due to LEO constraints, weakening its strategic independence. Without aggressive modernization and innovation and partnership with the private sector, the U.S. risks falling further behind, compromising its ability to predict severe weather, protect critical infrastructure, support military operations worldwide, and recapture global leadership in weather forecasting.

But, America's drive to innovate is second to none. Our commercial industry is constantly innovating and pushing the boundaries of what is possible. And it can do so for weather with your foresight. Giving agencies like NOAA the authority, the direction, and the resources to access the private sector will put the United States back on track as the world leader in weather forecasting.

In conclusion, I want to thank the committee for your time and commend you for your leadership in addressing this important issue. Thank you again.

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Figure 1

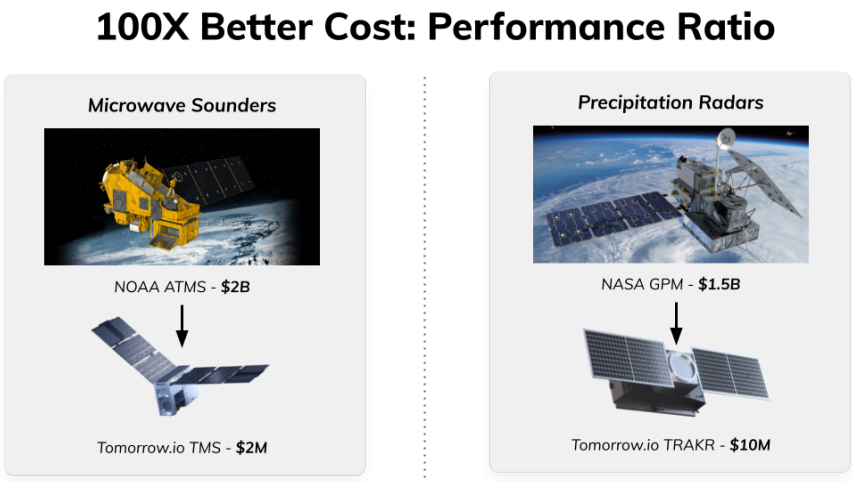

Figure 2

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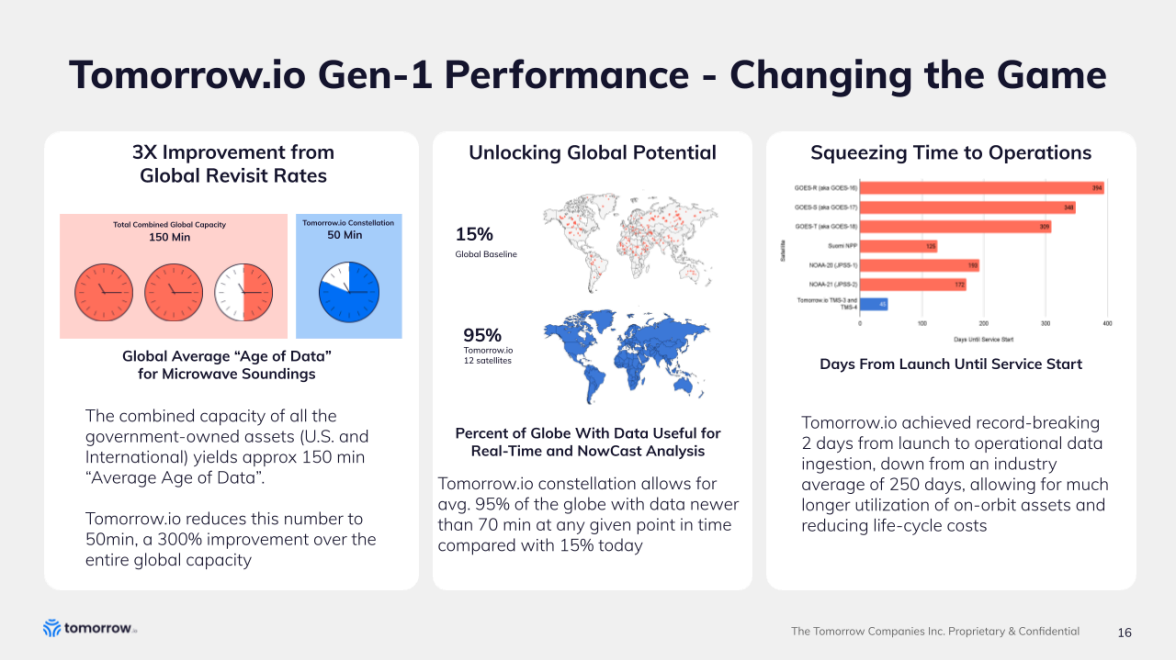

Figure 3