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BEFORE THE

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Chair Cleaver, Ranking Member Stivers, Distinguished Members of the Committee;

Thank you for the invitation to contribute to your time-sensitive deliberation on this time-honored day, when we memorialize the victims of the worst foreign attack in our country's history, and vow never to find the American people ill-prepared and exposed to knowable risks that threaten our lives, communities, and the commerce that thrives between us.

Like so many of us who will always remember the awful shock, terrifying images, and the sinking, suffering feeling that was etched into the soul of our nation on this fateful day eighteen years ago, I remain inspired by the collective determination of a generation to honor the memories of 9/11, and renew our country's collective resolve to imbue meaning in the phrase: "never again".

Never again should our government fail to protect America's citizens from life-threatening perils and economic upheaval that we can reasonably and proactively predict, through intelligence, analytics and insight. Never again shall we neglect an obvious "gathering storm", finding ourselves passive victims, having failed to ensure our safety and security through adequate planning. Never again should our fellow citizens pay the ultimate price in blood and treasure, when sound, cost-effective policy can shift the probabilities from sacrifice to safety. Honorable Members, I ask that we consider the significant lessons of this day, and our collective resolve, as the context for Congress's compelling need to act to ensure America's security, economic, and environmental well-being.

I was honored to be asked to serve the President and our nation in the aftermath of 9/11, to urgently address "America's addiction to oil". My mission was to galvanize the capacities of our incredible National Laboratories and the federal applied science programs at the Department of Energy, to stimulate our country's innovation and entrepreneurship at unprecedented speed and scale, in the middle of a war and an energy crisis, with the highest oil prices ever recorded. I am honored to be invited back to testify before this Congress, and I am grateful to be still be engaged in the mission of accelerating technology innovations to market for greater impact. I have increasingly focused on data science technologies with powerful applications for nature. This has the potential to durably establish the value of natural capital[1] as a source of strength for humanity, bolstering our preparedness and adaptive resilience in the face of disaster. In other words, I have focused on the tools, technologies, and business models that undergird our natural security and enhance our economic prosperity.

As today's hearing suggests, recurring destructive threats from rapidly changing climate conditions are endangering the lives and property of many Americans. As catastrophic peril threatens our shores and communities, we are obligated to do our utmost to ensure adequate preparation and agile responsiveness. Knowingly doing less, when our country is scientifically and technological capable of doing more, risks our children contemptuously accusing the 9/11

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[1] Natural capital is defined by various organizations as the country's or world's stocks of natural assets, including geology, soil, air, water, and all living things. Natural capital is the Nation's stock of biophysical capacity and supply capability, an asset which could be included as a component of the country's evaluation of national economic performance or GDP.

generation of failing in its duty to protect and preserve all we cherish most. We must not have history consider us so confused by "alternative facts", that even as we resolved to prevent and subdue global terrorism, we were blind to the catastrophic threat climate change poses to our communities.

This hearing is a timely reminder that we can still act with intention, in our enlightened self-interest, to design systems solutions to our most pressing problems. Our greatest national and natural security threats are less from rogue foreign terrorists, and certainly less from the columns of Red Army tanks we once invested trillions to defend against. Instead, our most dire and urgent threats are from the relentless rise of nature's fury, recurring with unprecedented harm, frequency, and severity.

We have all witnessed the shocking rise in record numbers of multi-billion-dollar natural catastrophes, with devastating economic and human tolls. From hurricanes and flooding to wildfires, droughts and heat waves, we are living in an age of accelerations, experiencing fluctuations in healthy habitats, loss of species and biodiversity and seeing the effects of climate change across geographies, communities, and economic sectors.

This week alone, the death and destruction from Hurricane Dorian arrived unwelcome in the Carolinas after devastating our neighbors in the Bahamas, with many people missing and 70,000 left homeless. In 2017 and 2018, the US experienced at least thirty natural disasters that resulted in excess of $1 billion in damages each.[2] The costs of climate-related disasters are steadily increasing, exceeding $450 billion between 2016 and 2018 alone, an average of $150 billion per year.[3]

Who pays? Who, if anyone, benefits from a collective failure to account for, plan, and allocate costs to smooth these impact of these shocks to our communities? We have the capacity to enable markets to operate far more effectively and intelligently, sharing risks more evenly and equitably. We can avoid scenarios where the weakest amongst us chronically suffer worst and first, due to vulnerabilities and volatility we have the power to minimize.

Although there are many facets of environmental degradation and destruction – from the deforestation and burning of the Amazon, to pollution of our oceans with plastics and our waterways with agricultural runoff, to the cascading, poorly understood effects of catastrophic climate change – the essential problem is the same. Current market systems are premised on the outdated assumption that natural resources are inexhaustible and can be exploited without impact. That nature will be tamed or conquered, rather than stewarded and conserved. This has encouraged market participants to asymmetrically privatize gains and socialize risks, when we need our corporate actors most incentivized to align with societal interests. We are not accounting for the costs of these actions, and we are socializing their risks, leading ourselves to react to environmental threats by default when we should be investing proactively, fortifying our security and economy with intention.

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[2] Hurricane Irma property damage at up to $65B: CoreLogic (Sept 20, 2017).
https://www.intelligentinsurer.com/news/hurricane-irma-property-damage-at-up-to-65bn-corelogic-13220
[3] NOAA National Centers for Environmental Information (NCEI), U.S. Billion-Dollar Weather and Climate Disasters (2019). https://www.ncdc.noaa.gov/billions/

We have historically lacked the tools necessary to accurately and cost-effectively measure and meter natural resources, beyond the commodity markets of exploitable or extracted goods. Due to the complex and dynamic physical properties of nature, traditional cost-benefit analyses have not justified measuring and metering access to natural capital, resulting in unchecked extraction and unmeasured externalities. Price discovery requires objective quantitative rigor, and the incumbent market rationale has been that the market clearing price of natural capital is zero. That is to say, according to our present market economy's parameters, nature and the services it provides to sustain us have zero value beyond that of the goods we take.

Ironically, we give greater value to perceptions of scarcity, and often end up incentivizing greater destruction in pursuit of the rarity of what remains. The carcasses of sharks litter beaches, slaughtered for their fins to ensure prized soups make the menus in Shanghai. Of course, we know from our own history – returning from the brink with America's wild salmon and bison herds – that we can recover through deliberate intention and design. This same thinking and theory of change that has been embedded in America's conservation practices applies to the market integration and accounting of natural capital.

Extractive systems have scaled exponentially throughout the industrial age, degrading the reliability and resilience of our fragile, dynamic, complex, adaptive life support systems. This tragedy of the commons is deeply interwoven with challenges of equity and justice, public health, and wealth and income inequality – all of which are compounded by unprecedented natural disasters and ecosystem shocks.

There are those who may consider markets to have failed us because of this and other "tragedy of the commons" conundrums. I am not such a person. I have personally experienced the power of free markets to lift people out of poverty and fill the public purse; to incentivize enormous leaps of innovation and prosperity. I am steadfast in the conviction that, when equitable and accessible in opportunities for a good society, market economics enabling free enterprise can be the most powerful and prolific source of transformation and social mobility. But one must sanction economic theory with practical and technical realities: markets themselves don't originate or implement strategy. Market mechanisms demand good governance and good operating parameters to guide good outcomes, including indispensable outcomes such as our national and natural security.

That's why humility, rather than ideology, must prevail when assessing the role of markets. We the people designed our markets, and we the people can and should update and redesign them, especially to integrate the benefits of innovation. This is as true for the birth of the aerospace industry as it has been for automobiles replacing horses and buggies, and digital optics replacing chemical films. All innovation has somehow, at some time, catalyzed Congress to shape outcomes for safety, health, and equitable benefits of growth and prosperity. This is no less true of the exponential technological surges in Silicon Valley and elsewhere, which have enabled unprecedented American growth in nano-materials manufacturing, high performance computing, data science, and other areas.

Due to their scaling function, properly designed markets can serve as an equally powerful corrective force. Advances in artificial intelligence, machine learning, and data processing have enabled us to cost-effectively collect and process data about the performance and health of nature. By harnessing these advances to accurately quantify the value of natural capital and internalize these values in financial transactions, we could fill a key information gap and enable markets to operate more efficiently. This informational advantage could be a major driver of differentiation and arbitrage opportunity for market participants. It would provide a competitive advantage to those who accurately measure and manage climate change risk, and monetize opportunities stemming from more accurate risk pricing.

Our present climate conundrum breeds opportunity as well as risk. We need to enable risk management through enhanced monetary policy, to shift capital formation and direct it toward solutions that exceed the pace of mounting problems. This alignment of incentives would reorient markets to maximize profitability in a sustainable way, reversing the tide of environmental destruction at a speed and scale commensurate with the challenge we face.

The systematic deficiency to account for nature's actual value has been accompanied by underutilization of nature's capacities to support our infrastructure and resilience. As the environmental, economic, and human costs of extreme weather and shifting climate patterns continue to rise, they are accompanied by infrastructure failures and turnover. This must be addressed with urgency, especially to protect our most vulnerable communities. This includes the tens of millions of Americans who live and work along coastlines, inland lakes and rivers, behind levees, and in other areas susceptible to natural catastrophes, sea level rise, and flooding.

Rapid replacement and retirement of carbon-intensive infrastructure is an opportunity to attract the next generation of investment in sustainable assets and supply chains. This includes significant investment in natural infrastructure / nature-based solutions: restoration, conservation of nature, and nature-based (bioengineered) systems. Accurately pricing climate change-related risks and opportunities is the fastest pathway to designing a sustainable transition toward a low-carbon economy that maximizes the benefits of green infrastructure.

Global markets are at an inflection point, where the direction and application of these technologies will determine long-term outcomes for markets and societies. There is growing marketplace momentum behind technological applications to measure and monitor natural capital, along with recognition of the threat posed by mispriced climate change-related risk. Technological advances in our ability to measure and monitor natural systems are ready to be widely deployed, and there is a need for good governance to guide these technologies toward the highest-value applications that align markets and nature.

The ultimate intended outcome of convergent alignment would be the acceleration of investments and infrastructure turnover that:

> (1) Reduces net emissions at the fastest mathematically feasible rate, and
> (2) Accurately aligns prices and risks to recalibrate the economics of solutions that restore and protect our healthy human habitats and communities.

Fundamentally, the failure to understand and account for natural capital is nothing more than a market imperfection. This design flaw externalizes the measurable value of things most vital to our longevity and excludes such considerations from our balance sheets, investment and return considerations. Congress should pose a paramount question and encourage action with its urgent answer: how shall we, as a society, responsibly draw upon the interest of our natural capital endowment, while preserving and even growing its principal for the inheritance of the next generation?

ECONOMIC IMPACTS OF CLIMATE CHANGE

The economic effects of climate change may likely become far more severe and far-reaching over time, with three broad categories of risk facing businesses:

- *Physical risks* can include non-linear impacts, such as multi-annual occurrence of historically rare events, resulting in unexpectedly high insurance claims burdens, supply chain disruptions, and other direct effects.
- *Transition risks* are more indirect and may be significantly affected by policy guidance and intervention to ensure a smooth and sustainable transition. These result from systemic disruptions in the transition to a low-carbon economy, including policy changes, market dynamics, technological innovation, and social shifts.
- *Liability risks* might include climate-related claims under liability policies, direct claims against insurers for failing to manage climate risks, or liability for inadequate disclosure of current and future risks.

Approximately $100 trillion of global infrastructure is estimated to be at risk due to inadequate insurance and risk management,[4] while almost 1.9 million homes worth a combined $882 billion are at risk of being underwater by 2100.[5] Yet present actuarial and other risk assessment models are woefully inadequate to predict these risks, due to overreliance on less accurate historical data and the inherent uncertainty involved in climate modeling. The world's top insurers and reinsurers, such as Swiss Re, Munich Re, Lloyd's, AXA XL, and RenaissanceRe are aware of these risks and expanding their in-house climate science efforts and teams to build better models and assessment tools to estimate these impacts.[6] This trend is not limited to the insurance sector, as demonstrated by Moody's acquisition of a majority stake in Four Twenty Seven, a leading provider of data, intelligence, and analysis related to physical climate risks.

The danger of mispriced risk is exemplified by the National Flood Insurance Program (NFIP), which provides the bulk of flood insurance coverage in the U.S. Through highly subsidized rates, the program has now borrowed over $40 billion from U.S. taxpayers. Although it provides critical coverage, the NFIP masks rates and risk, making it difficult for people vulnerable to

[4] Jupiter. (2018, February 12). Jupiter Launches Climate Data, Analytics and Technology Platform to Predict and Manage Weather and Climate Change Risks. Retrieved from https://www.globenewswire.com/news-release/2018/02/12/1339285/0/en/Jupiter-Launches-Climate-Data-Analytics-and-Technology-Platform-to-Predict-and-Manage-Weather-and-Climate-Change-Risks.html

[5] Zillow Research. (2017, June 2). Climate Change and Housing: Will a Rising Tide Sink All Homes? Retrieved from https://www.zillow.com/research/climate-change-underwater-homes-12890/

[6] (2018, October 2). Climate Change Is Forcing the Insurance Industry to Recalculate. *Wall Street Journal*. Retrieved from https://www.wsj.com/graphics/climate-change-forcing-insurance-industry-recalculate/

floods to understand or plan for known risks. This program has provided the lion's share of national flood coverage for decades without charging risk-based rates. FEMA itself has found that subsidized rates can promote poor decision-making by property owners and political representatives, while removing the incentive to undertake mitigation efforts and passing the costs on to taxpayers and society.[7] These subsidized rates largely do not end up benefiting low-income homeowners; over 78 percent of subsidized NFIP properties are located in counties with the lowest home values.[8] A parallel problem is underinsurance in the most vulnerable areas and a large protection gap in critical insurance coverage: only 40% of global losses from natural disasters in 2018 were covered by insurance, while only approximately one third of the $15 billion in losses resulting from Hurricane Michael were covered by insurance.[9]

Meanwhile, private companies are writing flood coverage, often at more reasonable rates, and providing tailored mitigation incentives. A large portion of insured risk is covered by reinsurers, who in turn spread these risks into the capital markets and beyond the US. We need the insurance and reinsurance industry to smooth shocks and remain healthy and stable through newfound volatility, which requires sensible collaboration in risk sharing and risk management to cover communities and people more economically.

In addition to the risks climate change poses to homeowners and business, these trends are giving rise to significant fiscal risk to the federal government and the greater economy. For example, according to the Trump Administration's landmark November 2018 National Climate Assessment report, the continued increase in the frequency and extent of high-tide flooding due to sea level rise threatens America's trillion-dollar coastal property market and public infrastructure, with cascading impacts to the larger economy.

New climate threats are no less asymmetrical to our military and civil defenses than conventional or historic ones. Both our Department of Defense and Department of Homeland Security have made clear the compelling need to address the looming consequences of a warming world. As first responders and uniformed services become stretched, along with budgets and agency balance sheets, it's imperative that we catalyze market forces, monetary policy, and good governance to strengthen transparency and disclosure as the indispensable characteristics of sound risk management and price discovery.

MEASURE THE TREASURE TECHNOLOGIES

Cost-effective technologies exist and are being deployed to gather accurate, reliable, verifiable collection of real-time data about ecosystem health. These include sensors, satellites and other remote imaging techniques, artificial intelligence, machine learning, connected devices / the Internet of Things (IoT), new applications of robotics, high performance computing, and open

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[7] Oliver Wyman. Flood Insurance Risk Study: "Options for Privatizing the NFIP. P52 Available at: http://www.floods.org/ace-files/documentlibrary/2012_NFIP_Reform/Reinsuring_NFIP_Insurance_Risk_and_Options_for_Privatizing_the_NFIP_Report.pdf

[8] Government Accountability Office, Flood Insurance: More Information Needed on Subsidized Properties (2013).

[9] Aon, Weather, Climate & Catastrophe Insight, 2018 Annual Report. http://thoughtleadership.aonbenfield.com/Documents/20190122-ab-if-annual-weather-climate-report-2018.pdf

source data ecosystems. These can collect data about real-time ecosystem attributes, and process complex data streams to rapidly respond to shifts in risk.

How much oxygen does a particular poplar tree produce? How much carbon precisely does a pine forest absorb each minute? How much soil moisture is equitably allocated to healthy and efficient crops at this hour? How many wild Pacific fisheries are reproducing at a greater rate than they are being depleted this week by the distant commercial fleet of a growing Asian economy? These have all become knowable as never before.

In a dynamic, adaptive world with computational power amplified by artificial intelligence and machine learning, we will be harvesting natural capital data that takes humanity well beyond conventional natural resource utilization and commodity supply chains, and into a more symbiotic relationship of precision accounting for the true value of ecosystem services. This hearing and the important legislative work of this committee and Congress must be informed by our rapidly evolving capacity to enable a universal and ultimately ubiquitous "Internet of Natural Things". This would be a truly World Wide Web that goes beyond connected man-made devices go inform, with accuracy and detail, not only models and projections of climate conditions, but also the real-time performance of our planet.

Such technologies are already disrupting and/or influencing best practices for the insurance and financial industries, where behaviors and products are projected to shift from "detect and repair" to "prevent and predict". Examples include faster and more automated purchase of insurance, more granular and sophisticated risk identification, behaviorally tailored and dynamic usage-based products, rapid underwriting and pricing innovation, and greater incorporation of sensors and other data capture technologies.[10] Insurance providers are already oriented toward the importance of rapidly integrating this data into risk assessment in order to maintain a competitive advantage.

These technologies can enable new capabilities to measure, monitor, manage, and monetize the same dynamic, elusive stocks and flows of natural capital that are currently assigned no value in most markets. Private actors pursuing environmental projects, companies seeking to strengthen their environmental and social governance (ESG) scoring, risk managers charged with fortifying balance sheets, as well as jurisdictions seeking performance and compliance are all desperately in need of clearer, more usable and easily translatable standards to justify and verify investments.

The foundational technologies exist for a real-time "Earth Dashboard" that could serve as an open-source, credible, and verifiable real-time digital data platform to aggregate and distill information about nature's health and performance, quantified in a way that is applicable to general accounting systems. These technology breakthroughs are fundamental to a new era of natural capital accounting with far greater, real-time transparency and disclosure. This, in turn, supports the redesign of antiquated risk management models and fosters restorative economic growth. This would be a game-changing introduction to markets, eliminating existing

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[10] McKinsey, Insurance 2030 – The impact of AI on the future of insurance, April 2018. https://www.mckinsey.com/industries/financial-services/our-insights/insurance-2030-the-impact-of-ai-on-the-future-of-insurance

inefficiencies, enabling price discovery, and ultimately creating a virtuous cycle that heals the relationship between markets and nature while unlocking new sources of value.

While the technology and financial communities develop the products and platforms to collect and translate this wealth of data, policy can have a vital role in shaping their application. One option would be through direct acceleration of relevant technologies and methodologies. Significant work remains to develop and validate methodologies for natural capital accounting. This work could be led by NIST, the National Academies, or the National Laboratories. Additionally, legislation could require a few federal agencies – BOR, BLM, FS, NPS – to test and implement natural capital valuation approaches, providing a public accounting of natural capital stewardship on public lands under their jurisdiction. Piloting at the federal level could help drive private sector development. Such efforts could lead to more comprehensive and granular, real-time public maps, communicating risks and trends related to floods, as well as storms, wildfire, and other climate-related risks. This could drive risk-based insurance rates as well as investment in mitigation measures.

Federal leadership could also be prioritized to focus on dissemination of best practices for natural capital protection to state and local decision-makers. Providing actionable, real-time, place-based guidance to develop localized projects – either through the National Labs or land-grant universities & county extension offices – would enable community-led efforts to harness the power of nature at a much higher rate and speed.

Another critical policy role is to catalyze markets that create demand pull for these innovations and applications. For example, allowing businesses to reduce their financial burden by purchasing international forest-based offsets would help accelerate the development of credible, verifiable, unitized offsets. Offsets are payments made by emitters to compensate landholders for preserving the land under their control. Under this nature-based-solution, governments and local communities benefit financially from maintaining their land, and businesses can "offset" or reduce the cost of complying with environmental and regulatory regimes. as well as global use cases for standards related to forest carbon credits and carbon emissions, fisheries and aquaculture, ocean health, air quality, and water.

Carbon offset methodology development and implementation within existing markets has significant contributed to the development thus far of practices, technologies, metrics, accounting and verification, and other components of market development. However, current verification requirements for carbon markets are onerous and expensive, and there is room for government-supported evolution of market-based approaches that value and monetize ecosystem services.

To manage and integrate the value of natural capital, we know we must measure it – not qualitatively and theoretically, but quantitatively and precisely. We can only truly manage what we can measure, and emerging for the first time in human history is the capacity to truly measure everything in our physical world. If we can measure and manage, then we also have the potential to continuously monitor and ultimately monetize the value of nature's ecosystem services. This would enable the ultimate achievement: internalization of environmental externalities, and transparency for the systems that secure our health and well-being.

NATURE-BASED SOLUTIONS

The ultimate outcome of these technology applications and market reforms is large-scale capital formation to sharply decelerate net emissions, and enhance community resilience to climate change. Nature-based solutions will be a critical part of this reorientation, and government should seek to maximize the cost-effectiveness of federal infrastructure investments within such parameters. This will maximize the cost-effectiveness of federal infrastructure investments. Nature-based solutions have been consistently found to be more effective than their "grey" counterparts, with scientific findings that nature can supply up to approximately 30% of the carbon abatement necessary to stabilize global temperatures by 2030.

It is clear that "natural systems such as wetlands, dunes, and riparian forests provide valuable protection to nearby communities from the impacts of floods and hurricanes by capturing and absorbing stormwater and buffering shorelines from waves and erosion."[11] A robust, economically sound response to climate related risk would pursue enhancement of these benefits. Some economists already estimate the United States benefits from as much as $23.2 billion worth of "green" storm protection services in the United States each year. Investing in and enhancing these critical American resources could yield cost effective results, and be particularly fit for purpose in rural or low density areas where significant new grey infrastructure may not be warranted.

Infrastructure development that reflects natural capital as a value can take many forms, such as use of low-carbon materials in construction, carbon capture and mineralization into cements, development of CO2 pipelines, and development of parks and green spaces in low-income areas. Natural capital infrastructure projects to date have often been pilot or demonstration-scale – using federal tax or bond policy to encourage systematic planning at a large spatial scale would have a much larger impact. Examples might include:

- *Agricultural management:* Biological sequestration involves using and managing land in ways that enhance the natural absorption of atmospheric carbon by vegetation and soil. Strategic agricultural practices—including conservation tillage, crop-mixture, grazing and grassland management—can augment the sector. A funding avenue could be pursued through farm subsidies policy; USDA currently has programs that could be modified or expanded.

- *Forest management:* Afforestation, reforestation, and reduced deforestation activities can maintain and increase the carbon potential of U.S. forests.

- *Federal land management:* It is fundamental to have improved federal land management to reduce wildfire risk. Similarly, legislative language could be enacted to require federal agencies (BLM, FS, NPS) to manage lands in a way that maximizes biological sequestration. Federal agencies could be required to quantify and then report, in real-time to the public and annually to Congress, on the amount of carbon sequestered on

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[11] Glick, Kostyack, Pittmann, Bricerno and Wahlund, "Natural Defenses from Hurricanes and Floods" 2014, https://www.nwf.org/~/media/PDFs/Global-Warming/2014/Natural-Defenses-Final-Embargoed-Until-102114-10amET.pdf

federal lands. Legislation could also require an annual increase of biological sequestration on managed federal lands.

- *Private sector incentives:* Currently, the U.S. funds a variety of coastal restoration projects, often through fossil fuel royalties or grants. In the private sector, The Nature Conservancy has launched a Blue Bonds for Conservation project, focused on unlocking $1.6 billion in capital for wetland and coastal preservation. Federal policy proposals in this area could include incentives for private investors to participate in third-party projects like the Blue Bonds, a federal reinvigoration of Brady Bonds to allow highly indebted poor countries to get debt relief in exchange for conservation, or increased local grants for restoration and resiliency projects.

- *Federal procurement policy:* giving preference in bidding to proposals that use natural capital to respond to federal needs.

- *Disaster risk reduction:* The 2018 $81 billion disaster relief package included a provision that requires rebuilding and recovery efforts to account for future risk. A well-designed infrastructure plan should incorporate the same common-sense provision. Such a program could also foster meaningful innovation and experimentation in "green" and "blue" infrastructure, which a number of studies strongly suggests can play a significant role in reducing disaster risk. A concrete measure put forward by the global disaster risk reduction community is investment in resilient infrastructure, including meadows and forests (green infrastructure), and lakes, swamps and peatlands (blue infrastructure), which can be combined with dykes and seawalls (grey infrastructure) for cost-effectiveness and greater protection.

CONCLUSION

We are faced with an urgent need to modify policy and modernize markets to address catastrophic failures of legacy systems. The core of an effective systems solution is to apply state-of-the-art technological progress to redesign markets and enhance risk management. This will ensure a rapidly scaling realignment of incentives, commensurate with the magnitude and timeframe of the risks posed by our changing climate.

Today we have the tools, technologies and the urgent compelling call to not only conserve nature, but to assess, quantify, and collaborate with its essential value. In doing so, we can strengthen the health and well-being of our populations and fortify our physical defenses against catastrophic risks. The resilience and effectiveness of nature-based solutions may likely exceed that of purely man-made, manufactured infrastructure.

We see an opportunity for policy to accelerate the application and integration of key technological advances, guiding them to meet the challenges posed by climate change risk. Policy can also better equip entrepreneurs and market participants to innovate products and business models that eliminate inefficient allocations of value in the current system, accelerating capital formation around solutions that understand nature as an ally in addressing climate risks.

The extreme weather events of recent weeks, months, and years are a sobering reminder that Nature's fury does not discern between Republicans and Democrats; red states and blue states. As Mother Nature's fever rises and the vital signs of our vital ecosystems become increasingly ominous, we may recognize once again that the futures of each and every American's security are inextricably linked to one another. Indeed, this can be extrapolated to the whole of humanity. When it comes to the risks of habitat health and ecosystem stability, we are truly a world without borders. And so, it's essential on this historic day, when we honor the fallen and the outsized heroic role of first responders to every community catastrophe, that we broaden our nation's renewed commitment to national security with recognition of an urgent new imperative of natural security.