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Statement by Dr. Tim Janssen, CEO, Sofar Ocean Technologies

before the

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Hearing on

"To the Depths, and Beyond: Examining Blue Economy Technologies"

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SOFAR

Introduction

Chairman Babin, Chairman Franklin, Ranking Member Amo, and Members of the Committee, thank you for the opportunity to testify today about how public-private partnerships (PPPs) are advancing ocean technology, enhancing economic growth, and benefiting the security and well-being of Americans, both now and for the future.

My name is Dr. Tim Janssen. I am an oceanographer, and CEO and co-founder of Sofar Ocean. Sofar is the global leader in marine weather intelligence powered by the largest private ocean sensor network. In my testimony, I will discuss the criticality of ocean data and how public-private partnerships are essential to advancing ocean technologies and the blue economy.

The world's ocean covers over 70% of the planet's surface, and ocean industries drive 3.5% of world GDP. In the United States alone, the Blue Economy contributes almost $400 billion to the nation's gross domestic product (GDP). Our Exclusive Economic Zone (EEZ) covers more surface area than our land surface area and supports fisheries, energy, transportation, recreation, and is a source of critical minerals.[1] In short, a significant part of our economy and future prosperity will depend on our ability to effectively monitor, understand, predict, and operate in our marine environment. Our success in that endeavour will ultimately depend on how effectively we can scale the rate of ocean data acquisition.

The ocean data gap is spectacular: if the total annual data collected by humanity represents the distance from here to the sun, then data collected from the ocean is estimated to be about the length of a football field. If not addressed, this data gap will have immense economic and

[1] NOAA, New Blue Economy. https://www.noaa.gov/blue-economy

strategic consequences. As everywhere else, a considerable part of the Blue Economy will transition into an information economy, leveraging rapid advances in artificial intelligence and machine learning (AI/ML) and other forms of data intelligence. But the challenge in developing ocean AI is not AI. It is *data*. Large Language Models (LLMs) that power successful AI applications (e.g., ChatGPT) are successful since they have an internet with petabytes of data to train on. There is no internet equivalent of ocean data – not even close.

The ocean data problem is not new, but addressing it is more urgent than ever. In fact, the lack of ocean information led me to found Sofar Ocean in 2016 to help solve this.

Closing the Ocean Data Gap: Exciting Frontiers

Today, Sofar Ocean, headquartered in California, operates the largest global ocean sensor networks to power ocean intelligence. We employ over 100 people, the majority engineers and scientists, and proudly manufacture all of our products and technologies right here in the United States.

We build ocean sensing hardware, including Spotter, a cost-effective, scalable sensor platform, and Bristlemouth, the open source connectivity standard [**Figures 1 & 2**]. Bristlemouth is the equivalent of open source USB for marine applications, and is a foundational technology needed to unlock scalable Ocean Internet of Things (IoT) connectivity for the entire ocean community, including both public and private organizations.

We deploy our hardware to create large-scale distributed sensor networks with global coverage [**Figure 3**] to create real-time situational awareness, and deliver unprecedented accuracy in marine weather predictions through a combination of data-assimilation and AI [**Figure 4**].

Finally, using our data and enhanced forecasts, we built Wayfinder, a software-as-a-service (SaaS) product for commercial shipping to dynamically update routes and speed strategies to save fuel, increase safety, and reduce emissions [**Figure 5**].

Our technologies are aimed at driving scalability of ocean data by reducing the complexity and cost of ocean sensing, allowing industry, academia, *and* the government to access novel, critical datasets at an unprecedented scale. Ultimately, our goal is to build the ocean IoT framework that unlocks the opportunity of ocean AI.

Our progress in building an ocean data company greatly benefited from effective collaborations with major government organizations including NOAA. Though our revenue comes primarily from non-government customers, we see partnership with the U.S. government as essential to accelerating innovation and building economic opportunity. Neither side can do this alone.

The Future of Blue Economy Technologies will Depend on Robust Public-Private Partnerships

The ocean economy is large, yet nascent, and there is public need for the same ocean technologies and information that drive direct value for private industry. More and better ocean information benefits everyone by improving the safety of coastal communities, the economic

outlook for fisheries and aquaculture, the efficiency of offshore energy, and the investment opportunities for venture capital and private equity in an information-driven blue economy.

We can accelerate the pace of ocean data collection through public-private partnerships – I have seen this firsthand in my experiences as an oceanographer and an entrepreneur. In these partnerships, the government gains access to technology innovation at the speed and efficiency of startups, the U.S. economy gains new businesses and good-paying manufacturing and scientific jobs, and our society gains all the benefits of the ocean economy, including improved coastal safety and greater awareness of our ocean planet and its natural resources.

Today, I will highlight a few key examples of how Sofar Ocean has partnered with the federal government to accelerate ocean technology.

First, I'd like to highlight ***Bristlemouth***, a foundational open-source technology that delivers a connectivity standard like USB for the marine environment. Similar to USB, Bristlemouth unlocks rapid scalability for ocean IoT which is essential for ocean data collection and the development of advanced marine edge- or cloud-based AI/ML applications and intelligence. Sofar partnered with several U.S. federal agencies (Office of Naval Research, NOAA, and DARPA) and philanthropic organizations to develop and open source Bristlemouth. The Bristlemouth partnership highlights the complementary strengths of public and private organizations: Sofar, as a private company, can move fast and deliver cutting edge technology, but must focus on commercial outcomes to earn back its investments. When operating alone, this limits our ability to drive bigger impacts. However, through partnerships with government organizations, the far larger public value can be realized effectively as well, by making the

technology broadly accessible and open. The Bristlemouth standard is now being used operationally across private industry, educational institutions, and federal civilian and defense agencies to scale ocean sensing, empowering our next generation of engineers and serving the public need. This broad value across the private and public sector is only realized because Bristlemouth is open source, a step we could not have realized without government support and partnerships.

As another example, ***AI- and data-driven marine weather forecasting*** is significantly enhancing efficiency and safety at sea. Our progress in the forecasting field is supported through active collaboration with teams within NOAA. At Sofar, we build cutting-edge data assimilation strategies in the cloud and deploy the latest in AI to improve efficiency and effectiveness, but we can accelerate this fast because of the foundational physics-based models, operational forecasting capabilities, and decades of improvement that the U.S. Government has invested in. The partnership with teams within NOAA, such as the Geophysical Fluid Dynamics Laboratory (GFDL), and other government agencies, catalyses innovation through complementary capabilities and collaboration. Progress in data-driven and AI/ML forecasting also ensures the U.S. remains at the forefront of smart maritime operations, with tools such as Sofar's Wayfinder route optimization. These advancements not only support the maritime shipping sector but also benefit U.S. Navy operations, as demonstrated in our pilot program with the Navy Fleet Weather Centers, the ONR-funded MARSHAL program, and the Navy's Operational Energy (OE) and Operational Logistics (OPLOG) Programs.

Public-Private Partnerships Leverage Strengths for Outsize Impact

Government agencies have an obligation to protect and serve the public and are less sensitive to the volatility of direct market economic drivers. And this is exactly where private and public can complement each other. For instance, government agencies maintain vital public infrastructure, such as tsunami warning networks, which would be unsustainable by industry on their own, but such networks can be enhanced by private sector innovations that have market demand for other use cases. There are numerous examples from my experience at Sofar demonstrating how a greater outcome is achieved by partnering, rather than operating independently or competing:

- **Early research and development of the Spotter buoy** was funded in part by the Department of Energy to support marine renewable projects. The Office of Naval Research and NOAA funded parts of the development of our marine weather modeling system. This funding helped build early products, and was a catalyst to attract private sector investors to accelerate the business and technology development. We are not alone in this: a recent study found that federal funding for basic research to companies bestows confidence in startup technologies and catalyzes additional private investment in emerging fields.[2]
- **Our engagement with the National Oceanographic Partnership Program (NOPP)**, a partnership between NOAA, the Office of Naval Research, other federal research agencies, academia, and industry, led to the rapid development of an operational, air-deployable version of our weather and wave buoy (Spotter) that can be deployed directly into hurricanes [**Figure 6**]. The process was accelerated by access to federal aircraft for deploying the buoys, federal forecasting and modeling expertise, and federal

[2]SSRN, "Venture Capital Response to Government-Funded Basic Science," https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5044008

data sources for data validation. The data collected from these Spotter buoy deployments (including from 2024's Hurricane Milton) has shown to be instrumental in enhancing hurricane prediction capabilities at the National Hurricane Center and regional Weather Forecasting Offices, providing public safety benefits.

- **Through our Cooperative Research and Development Agreement (CRADA) partnership with the National Data Buoy Center (NDBC)**, we are able to complement the mission-critical DART buoy network with wave spectra data, a unique data source. Our partnership also enables us to fill regional data gaps with Spotter buoys and provide this data to the Ocean Prediction Center (OPC), while NDBC provides access to vessels of opportunity – benefitting maritime safety and improving our ability to model and predict ocean behavior at a global scale.
- **Our CRADA with the Naval Meteorology and Oceanography Command (CNMOC)** has led to substantial improvements in marine weather forecasts that directly support naval operations and also resulted in route efficiency for naval supply vessels, while providing Sofar with access to federal operational and oceanographic expertise. Our Spotter buoys provide high-quality, real-time oceanographic data, which significantly enhances battlespace awareness, maritime security, and operational safety for defense activities.
- **We license data from our global buoy network through NOAA's National Mesonet Program** as well as to other government customers. This enables the government to access a rich ocean dataset at a fraction of the cost of maintaining its own infrastructure.

- **We are working with the Office of Naval Research** to deploy Bristlemouth-enabled hydrophones to aid in a variety of environmental and maritime domain awareness operations, with the Army Corps of Engineers to improve real-time monitoring of coastal dynamics, and with the U.S. Marine Corps to improve surf monitoring and forecasting.

Looking Ahead: Policy Recommendations

Public-private partnerships are already instrumental in ocean data collection and the promise of ocean AI, but the federal government can be an even stronger partner to industry to ensure these advancements deliver end-to-end value to the public and accelerate the American Blue Economy.

First, reauthorize the Weather Act. The reauthorization sustains critical programs that contribute to closing the ocean data gap, including the National Mesonet Program, which integrates private data streams into federal forecasting systems to improve accuracy and timeliness. It also supports integration of commercial technologies for improving forecasting of specific ocean-driven phenomena like atmospheric rivers and coastal flooding. Finally, a reauthorization will incentivize commercial companies to partner with agencies by reducing barriers to entry.

Second, maintain funding for the development of foundational technologies through NOAA and other federal agencies to support market drivers for emerging marine technology. To deliver on a thriving Blue Economy, government agencies should incentivize early-stage innovation and research while insisting on clear pathways for adoption and scalability. Investment in fundamental research helps unlock technological advancement that can later be scaled by industry.

Third, streamline procurement processes and emphasize flexible contracting mechanisms. Government contracting – even for zero cost contracts like CRADAs – are slow and unnecessarily complicated. This must change. Complex contracting processes push companies to either specialize in government work or avoid it entirely. This is not in the best interest of the government. Incentivizing companies to engage with federal agencies through effective contracting structures will increase competition and access to cutting-edge technologies. Although the Federal Acquisition Streamlining Act (FASA) was meant to address this by prioritizing the acquisition of commercial items, implementation falls short. For example, commercial data is available to support many government needs, but the commercial item preference and data-as-a-service contracting mechanisms either do not exist or are not enforced. In simplifying contracts, there is also an opportunity to shift more toward milestone-based contracts rather than cost-based contracts. This ensures commitment to outcomes rather than efforts, and shifts the burden of budget risk from the government to the private partner.

Conclusion

The Blue Economy is large, yet nascent. In the coming years, a large part of the growth of the Blue Economy will be fueled by an information economy and AI. The rate of this growth will largely depend on our ability to develop scalable ocean data acquisition and ocean IoT to unlock the economic opportunities delivered by advances in AI/ML. This is an exciting prospect and the upside is immense, both for the public and private sector.

Today, the ocean is an information desert and cannot support a scalable data- and AI-driven economy. Rapid change is possible, and requires strong and effective public-private partnerships

as demonstrated by the examples listed in this testimony. If we strengthen these partnerships we can move much faster. If we stop investing in ocean technology, the pace will slow, and the opportunity to scale the Blue Economy into an information economy may be lost.

To succeed and scale ocean information and the Blue Economy, we must develop core enabling technologies. Rapid innovation is happening in the private sector, but these broad capacities are very hard for any single company to support on their own. Effective federal partnership is a critical catalyst. And we need more of that, not less. We need to enable government organizations like NOAA and others to continue to be effective partners in this ocean endeavour. The ocean data gap is widening, and we cannot afford to lose more time in closing it.

I believe Congress is well positioned to support public private partnerships and ensure America continues to be a leader in the blue economy, bolstering our national security as well as the health and safety of our coastal communities.

Thank you again for this opportunity to testify.

Table of Figures

Figure 1: The Sofar Spotter buoy is a compact, cost-effective ocean sensing platform that delivers data in real time.

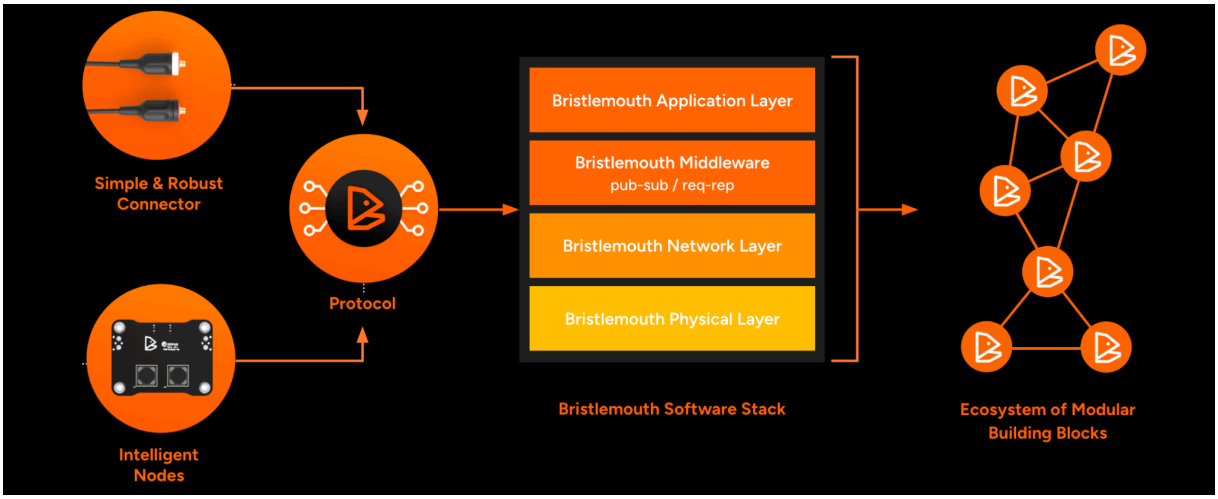

Figure 2: The Bristlemouth standard, akin to a USB for the ocean (see connectors in the top left circle), enables plug-and-play interoperability between marine hardware systems and a software stack (center), speeding innovation and data collection.

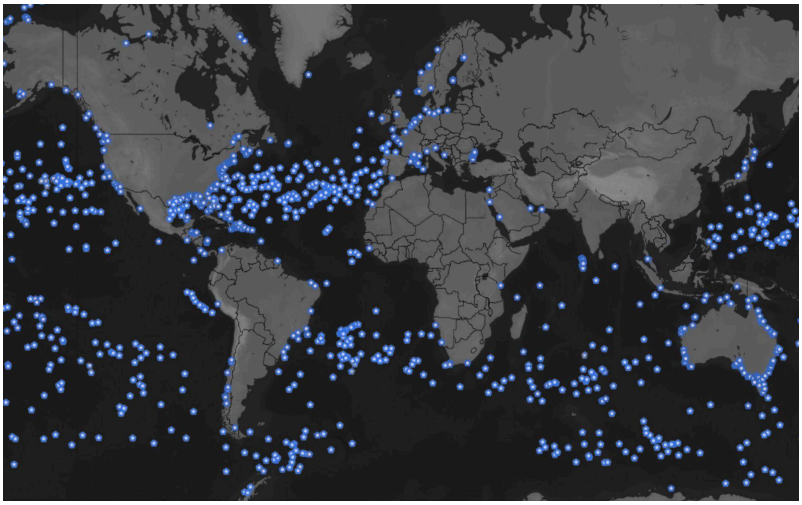

Figure 3: Sofar's global buoy network is the largest privately owned ocean sensor network in the world.

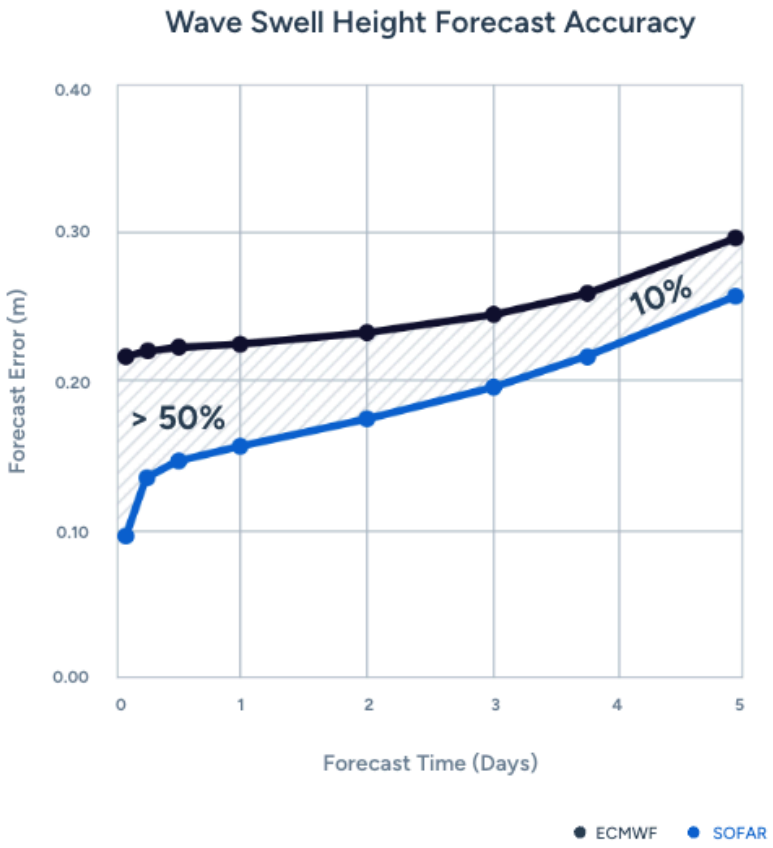

Figure 4: The Sofar marine weather forecast is up to 50% more accurate than other leading forecasts (e.g., ECMWF)

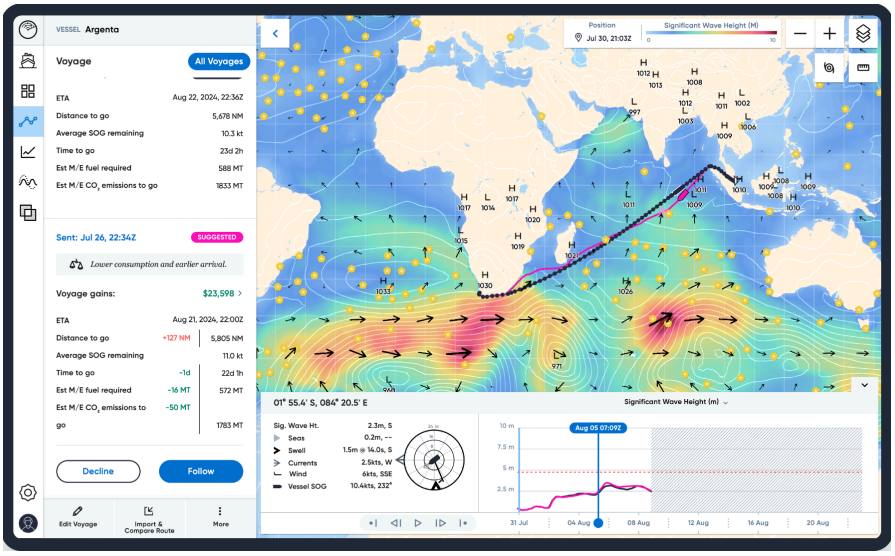

Figure 5: Sofar's Wayfinder route optimization platform leverages highly accurate ocean predictions to recommend routes that improve safety and save fuel.

Figure 6: In partnership with the NOPP program, Sofar developed an air-deployable Spotter buoy, which has been deployed into hurricanes including 2024's Hurricane Milton.