

**CONGRESSIONAL TESTIMONY OF
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**BEFORE THE
U.S. SENATE COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION
SUBCOMMITTEE ON SCIENCE, OCEANS, FISHERIES, AND WEATHER**

**HEARING ON: RESEARCH AND INNOVATION:
ENSURING AMERICA'S ECONOMIC AND STRATEGIC LEADERSHIP**

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Chairman Gardner, Ranking Member Baldwin, and members of the committee, thank you for the opportunity to testify before you today.

I am here to share with you today several examples of the impact that universities can have on American economic and strategic leadership, and at the same time encourage further investment in the research and innovation that is uniquely American. The university system in the U.S. has been the envy of the world, and nowhere can a public, land-grant university have a bigger impact than on a state like Mississippi, where pressing needs can be changed to immense opportunity. Mississippi State University has long played a leadership role in our state's economic development, and has embraced that role as a means to lift us out of poverty and disadvantage. First and foremost, we believe that this impact comes from a high-quality education of our citizens, coupled with a strong work ethic, integrity, and passion for improvement.

Federal investment in research has made a tremendous difference in our state. Mississippi State University (MSU) won a National Science Foundation (NSF) Engineering Research Center (ERC) in 1990, focused on computational field simulation. We have many success stories that came from that ERC, but none more important than how it was used to attract Nissan to the State of Mississippi. As a part of the incentive to attract Nissan, we leveraged the ERC to create a new Center for Advanced Vehicular Systems (CAVS) at MSU, with a combination of basic engineering research and industrial outreach to support the automotive industry in the state. In the past ten years, CAVS has had an impact of over \$2.9 billion in the state through jobs saved or created, as measured by the US Commerce Department. Without the NSF investment, I doubt any of this would have been possible.

Universities are also engines of entrepreneurship. At MSU, our Thad Cochran Research, Technology and Economic Development Park is full to overflowing in phase 1, with phase 2 now being filled, and an additional incubator purchased in downtown Starkville. We are proud to partner with leading technology companies such as II-IV, Inc., Camgian Microsystems, HBM nCode, and Babel Street. However, we have also developed companies from student and faculty entrepreneurs. Horne Cyber is just such a company; founded based on technological capabilities of faculty, it is now one of the leading cyber-security companies in the US.

Land-grant universities are heavily invested in community success as well. Our Carl Small Town Center has taken a nationally-recognized leadership role in helping smaller cities reimagine their future and develop a strategic plan to turn failing communities into thriving cities and towns. The MSU Gulf Coast Community Design Studio was created after Hurricane Katrina, and has won national awards for its design work for resilient and cost-effective housing after natural disasters.

Universities conduct research and development activities that enable civil applications of basic and defense-related research. MSU is the lead institution of 23 universities that formed the Federal Aviation Administration (FAA) Center of Excellence for unmanned aircraft integration into the national air space. The Center of Excellence for Unmanned Aircraft Systems Alliance for System Safety of UAS through Research Excellence (ASSURE) has been tasked with conducting research addressing FAA's highest priorities, including air-to-ground collision modeling, detect-and-avoid technologies, control and communications, and human factor performance in operations. The ASSURE consortium has become the de facto standard for answering the most pressing questions regarding safe and effective use of drone technologies in civil applications. Since its founding in 1948, our Raspet Flight Research Lab has been a premier center of excellence for innovation. Raspet served as an incubator for Stark Aerospace, Airbus Helicopter, Honda Jet, GE Aviation, and Aurora Flight Sciences.

Following graduation from the ERC program, which I mentioned earlier, MSU recognized the unique opportunity it had created, and heavily invested in high performance computing as a tool for modeling and simulation that would not be possible otherwise. As a result, we have partnered with the National Oceanic and Atmospheric Administration (NOAA) to build the fourth-fastest computer in US academia, focused on providing the tools necessary for advancing research in weather and severe storm simulation. We are also partnering with other agencies such as the U.S. Department of Agriculture (USDA) and Homeland Security to meet their computational needs. This computing capability is also extended to corporate partners as well, moving their capabilities into a parallel-computing environment through our expertise.

As a land-grant, MSU is consistently recognized as a leading research institution in agriculture and natural resources. We have many, many success stories from the partnership we have with USDA's Agricultural Research Service, but none more important than the warmwater aquaculture program that has spawned a strong industry in the U.S. that provides safe, flavorful, and healthful products to the US and international consumers.

I could continue with many other research and development successes that have come from my institution; however, these are sufficient to make the point – none of them would have happened without federal investment of research dollars. Research funded by Defense, NOAA, FAA, USDA, Commerce, Interior, Homeland Security, and many other agencies has all stimulated innovative research findings that are leading change in our state and nation.

I have provided examples relevant to my university, but I could also tell similar stories for many other institutions across the nation. However, these success stories are in jeopardy without renewed investment from the federal government. To quote from the National Academies of

Science 2010 study “Rising Above the Gathering Storm, Revisited”: “Today, for the first time in history, America’s younger generation is less well-educated than its parents. For the first time in the nation’s history, the health of the younger generation has the potential to be inferior to that of its parents. And only a minority of American adults believes that the standard of living of their children will be higher than what they themselves have enjoyed. To reverse this foreboding outlook will require a sustained commitment by both individual citizens and by the nation’s government...at all levels.”

Members of the committee, I urge you to see federal investment of research funding in just those terms: investment. These investments are critical if we are to ensure our future as an economic and strategic global leader. And, this investment must be:

1. Broad-based geographically. We must support the best and brightest students and researchers wherever they are, not just at a few locations if we as a nation are to make the progress you envision.
2. Trans-disciplinary in nature. The most challenging issues we face today cannot be solved by any one or even a few disciplines. Rather, issues such as health disparity, food security, and water scarcity can only be solved by the hard sciences and social sciences working together in new and novel ways.
3. Broadly supportive of both fundamental and developmental research endeavors. Both basic and applied research are critical if we are to lead the world in innovation and entrepreneurship.
4. Encouraging federal, state, university and industry partnerships. We must find ways to invest in research that leads directly to innovation that spawns entrepreneurship and economic development in the private sector. Historically, our economy is based on this innovation, and with reduced private investment in research, federal funding is ever more important if we are to continue to lead the world.

Chairman Gardner, Ranking Member Baldwin, members of the committee, I thank you again for the opportunity to testify before you today. Should there be any need for follow-up conversations, I and Mississippi State University stand ready to serve.