Federal research funding aims to ease societal challenges
A key goal is to spread access to scientific excellence and federal research funding nationwide

By Anne Q. Hoy

Half of all federal research funding in the United States goes to recipients based in six states and the District of Columbia, leaving the other 50% of funding split among those in the remaining 44 states, the National Science Foundation’s annual Survey of Federal Funds for Research and Development shows.

The concentration of geographic funding to primary recipients in California, Maryland, Massachusetts, New York, Texas, Virginia, and the District of Columbia was cited by Kei Koizumi, a senior science policy adviser for the American Association for the Advancement of Science, during a panel presentation exploring the evolution of federal research funding in the United States, France, Japan, and other Organization for Economic Co-operation and Development member countries.

“We have abundant research that shows the majority of U.S. students go to school in their home states,” said Koizumi during the presentation on 13 July. “So, if research funding is not happening in their state, then they are missing out on an opportunity to participate in our science and technology enterprise.”

Concentrated research funding distribution levels, he added, deny states economic development, growth, and jobs that the system develops.

The presentation was held at the biennial EuroScience Open Forum 2018 in Toulouse, France, a gathering of more than 3000 scientists, innovators, policy-makers, and business representatives 9–14 July to discuss scientific research, innovation, and science policy issues. AAAS CEO Rush Holt moderated a session on science diplomacy and AAAS staff highlighted activities of AAAS’s Cambridge, U.K., office and the online, global news service EurekAlert!

In recent years, geographic funding concentration levels in the United States have remained fairly consistent. Yet the country’s leading federal research funding institutions have been testing experimental programs to spread federal research funding more equally across the country to address economic and social inequities.

Science and engineering research funding programs are searching for ways to provide university students in every state an opportunity to search for knowledge, extend scientific excellence, and, in so doing, ensure that the system tackles larger societal issues, said Koizumi.

“It is important, both politically and socially, to address inequalities on multiple dimensions, and science funding is not exempt from that imperative,” Koizumi said. “We have seen that competitive research funding mechanisms, left to their own devices, can result in inequalities. They can perpetuate other inequalities that exist in society.”

Adjusting the funding system to support multiple societal objectives as it also seeks to produce scientific excellence is not easy, noted Koizumi in his session on “Supporting long-term research in a world of sudden change: The evolution of research and funding in current financial and political contexts.”

“It is, of course, a common insight now to see that the U.S. scientific workforce does not look like the U.S. population, and so diversity and inclusion are important considerations for how we support the U.S. scientific enterprise,” added Koizumi.

To overcome impediments, the National Science Foundation, the Departments of Energy and Agriculture, and NASA have established programs under the Established Program to Stimulate Competitive Research, or EPSCoR, which was established in 1978 to enable universities across the country to compete for federal research funding. The National Institutes of Health began a similar program 25 years ago known as Institutional Development Awards, or IDeA. Both programs continue to grow.

For two decades, AAAS has supported more than 30 states by providing 151 assessments of more than $1.2 billion in research projects funded by NSF’s EPSCoR and NIH’s biomedical research IDeA programs. AAAS’s Research Competitiveness Program, or RCP, conducts the work and provides peer-to-peer insights from independent U.S. experts and, more recently, quantitative evaluations of projects. In addition, RCP is now working on a NSF study to devise a framework for measuring academic research excellence and competitiveness for EPSCoR and potentially other NSF programs.

“Our programs strengthening STEM ecosystems within the U.S. have parallels to national STEM initiatives in other countries,” said Charles Dunlap, RCP’s program director. “While we continue to support institutions in the U.S., institutions abroad are increasingly contacting AAAS for support as well.”

A range of other collaboration models also have emerged. One is organized around national objectives such as improving health care, addressing climate change, or expanding manufacturing opportunities. Other competitive funding initiatives promote cross-sector collaborations that align private businesses with research universities and federal research laboratories and international collaborations that match scientific research groups with global partners to pursue shared scientific goals.

Competitive research funding endeavors also focus on “high-risk, high-reward research, or potentially transformative research,” said Koizumi, in a drive tooffset the tendency among experienced researchers in a highly competitive funding arena to pitch less risky and shorter-term proposals.

Since World War II, the federal research funding system has helped the United States become the world’s leader in science and engineering innovation. With time, though, system flaws have emerged, including stress on success rates due to the growing number of research proposals that fall short of funding, a development that raises the cost of the scientific review process. The system also has failed to expand the ranks of underrepresented minorities and women in the scientific enterprise.

In addressing the state of today’s competitive research funding system, Koizumi said, “With careful attention we can use competitive research funding to attempt to address the challenges of inequalities both inside the scientific enterprise but also with our society at large.”
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