

MEMORANDUM

TO: Legislative Oversight Commission on Education Accountability (LOCEA)

FROM: Dr. Juliana Serafin, Senior Director, Division of Science, Technology and Research, HEPC

DATE: September 1, 2022

RE: Research Challenge Fund Annual Report

West Virginia Code §18B-1B-12 requires the West Virginia Higher Education Policy Commission to report to LOCEA annually on the results of the projects and activities funded by the Research Challenge Fund (RCF) appropriation.

Since it was created in 2004, the Research Challenge Fund supports undergraduate and graduate students in the STEM fields (Science, Technology, Engineering and Math) and creates a highly skilled diverse workforce, leading to new economic possibilities for West Virginia. The RCF is instrumental in helping West Virginia build its scientific research infrastructure and reputation by attracting and developing top university scientists who can obtain independent federal funding for important research. The Research Challenge Fund is evidence of the state's ongoing commitment to support science and technology research, education, and outreach.

In Fiscal Year 2022, RCF supported the following grant programs and services:

- **Research Challenge Grants** support the creation of research centers and foster economic development and workforce advancement (\$1.3 million for each of 3 awards distributed over 5 years).

For the period 2018 – 2022, the three Research Challenge Grants are:

- 1) Advancement of Science and Engineering for Localized Gas Utilization (WVU and Marshall University),
- 2) Foundation of the Vaccine Development Center at WVU (WVU)
- 3) Center for Cognitive Computing (C3): A Multidisciplinary Research Center for Excellence (WVU).

All three projects have made excellent use of the state's investment by leveraging the initial backing into further grant funding from federal sources, supporting scores of students and postdoctoral fellows, and producing hundreds of publications on important cutting-edge research. Additionally, these projects have thus far have resulted in \$59.2 million in external follow-on funding and have developed industry-academia partnerships. These three projects were featured in a recent edition of the *Neuron* magazine published by the STaR Division, which can be accessed here: https://wvresearch.org/wp-content/uploads/2022/06/Neuron_Vol18Issue1_Digital.pdf

These awards will expire at the end of 2022. New proposals for the 2023-2027 period have been received and are under external review. The new grants will start in January 2023.

- **Summer/Semester Undergraduate Research Experience (SURE)** awards are used for undergraduate research stipends to fully or partially support ~100 students annually at Marshall University, Shepherd University, West Liberty University, West Virginia State University, WVU, and WV Wesleyan College. (The sum of six awards is \$300,000 per year, for three years from 2020-2022. Note that due to 2020 summer COVID-19 shutdowns, these grants have been given an extension to 2023.) These awards help undergraduates develop much-needed research/laboratory skills and support their undergraduate work in STEM fields.
- **Science, Technology, Engineering and Mathematics (STEM) Fellows** grants are for STEM doctoral (PhD) students at WVU and Marshall. This grant provides significant support to WVU and Marshall for their STEM research programs and helps maintain their respective national R1 and R2 research rankings. These doctoral students play an important role in obtaining federal funding. Due to COVID-19 research lab shutdowns in 2020, the awards were extended a fifth year, i.e., to 2017-2022. The total for five years will be \$800,000 to Marshall and \$1,675,000 to WVU. New awards for 2022-26 started in FY23.
- **Technical Assistance** provides an external expert review service to help STEM faculty develop competitive proposals for funding from federal agencies. In FY22, 88 proposals from individual faculty, or from collaborations between faculty at multiple higher education institutions were reviewed by the service, providing critical feedback for improvement of the proposals to make them nationally competitive. Year to date, \$5.6 million has been funded for the proposals reviewed in FY22. Special review services were also provided for the NSF EPSCoR proposal which is for \$20 million grant over 5 years; the award decision for this proposal will be made in March 2023. (\$150,000)
- **Opportunity Fund** provides small, one-time awards (~\$5000 each) to assist research faculty/students and for STEM programming (total funding per year is \$40,000). In FY22, more proposals were funded (11) because COVID shutdowns resulted in a low number of proposals being received in FY21. Three events were funded: 2022 Undergraduate Research Day at the Capitol, the Chemical Landmark Dedication in Clendenin, and the Inaugural Marshall University Research & Creativity Symposium. There were 5 awards for faculty/student travel and/or research for Fairmont State University, Glenville State University, Marshall University, West Liberty University, and WV Wesleyan College. Community awards for STEM projects went to the Huntington Children's Museum, the A.D. Lewis Community Center, and Mylan Park Elementary School.
- **Innovation Grants** provides one-time awards for equipment, supplies and minor renovations of laboratory spaces for undergraduate education and research. A single FY'22 award went to West Virginia State University to build a student oriented Artificial Intelligence Lab with appropriate computers. (\$40,000)
- **Required Cost Share to NSF EPSCoR RII Grant and Grant Management** (\$255,000)

Summary:

In 2021, *Vision 2025: West Virginia Science & Technology Plan* identified growth of the research enterprise and development of the STEM Talent Pipeline at our universities as key areas of focus for the state. Clearly, the grants and programs funded by the Research Challenge Fund are some of the primary efforts needed to achieve this goal. It is especially impressive that the \$3.9 million seed funding state investment for the three Research Challenge Grants has resulted in a return on investment of \$59.2 million in independent funding from federal and private corporations. In the words of Professor Jianli (John) Hu, the principal investigator on the CIRGU Research Challenge Grant which makes higher value chemicals from natural gas: “By leveraging the RCG seed funding, now we can compete with research grants at the national level. Without this preliminary data or the findings, it’s very difficult to compete.” The \$59 million in further funding supports research facilities, students, and postdoctoral fellows, allows WV researchers to publish hundreds of publications, and brings important opportunities for industry-university partnerships. In the August call for proposals for the 2023-2027 Research Challenge Grants, a total of 18 proposals were received, indicating that state researchers also realize the value of the program.