



Overview

The National Science Foundation (NSF) Established Program to Stimulate Competitive Research (EPSCoR) contracted with 2M Research in 2020 to conduct a pilot study¹ to help better understand the ways and extent to which jurisdictions seek to achieve academic research excellence and competitiveness beyond funding level. The purpose of the study is grounded in the exploratory analysis of contextual variation in EPSCoR jurisdictions. The study developed a new Academic Research Excellence & Competitiveness (AREC) framework that included literature reviews to inform the development of preliminary conceptual definitions, logic models, compilation of indicator data from administrative and public records, descriptive analysis, and mathematical modeling. AREC is represented within a science, technology, and innovation system that considers multiple stakeholders and influences. The AREC systems view of research competitiveness is a flexible framework to explore, define, and measure research competitiveness. The study found that jurisdictions approach “competitiveness” in complex contexts using varied strategies that target different outcomes. The findings from this study are highly relevant today because they lay the groundwork for mapping the future of EPSCoR which includes multiple pathways targeting the unique requirements and interests of jurisdictions.

Contextual Variability

Figure 1. Jurisdictions cluster around similar contextual measures

Cluster 1		Cluster 2		Cluster 3	Cluster 4
Alabama	Maryland	Arkansas	Alaska	North Dakota	All other non-EPSCoR jurisdictions
Kentucky	Massachusetts	Iowa	Delaware	Rhode Island	
Louisiana	Minnesota	Kansas	Hawaii	South Dakota	
South Carolina	Washington	Mississippi	Idaho	Vermont	
Missouri	Wisconsin	Nevada	Maine	West Virginia	
Tennessee		Oklahoma	Montana	Wyoming	
Arizona		Utah	Nebraska		
Colorado		Connecticut	New Hampshire		
Indiana		Oregon	New Mexico		

Note: Current EPSCoR Jurisdictions, Past EPSCoR Jurisdictions, Non-EPSCoR Jurisdictions

The study sorted 20 contextual variables identified in the research competitiveness literature into three domains: (1) Environment and Institutional Capacity (e.g., population, rural/urban, racial diversity, number of R1 institutions), (2) Research Capacity (e.g., economic base, number of science and engineering students and workers, federal funding), and (3) Jurisdiction-level Financial Resource Capacity (e.g., support for Research and Development activities to complement federal funding for research). Jurisdictions with similar characteristics formed four cluster groupings, as shown in Figure 1. Context can shape strategic choices and desired outcomes; therefore, there may be potential value in designing cluster-tailored transformation efforts.

A fraction of jurisdictions have contextual domains similar to non-EPSCoR jurisdictions (Cluster 1). Several current and previous EPSCoR jurisdictions displayed similar Environmental and Institutional Capacity contexts to non-EPSCoR jurisdictions.

¹ Meek, Caroline, and Nisar, Hiram. 2020. Study of the Established Program to Stimulate Competitive Research (EPSCoR). Alexandria, VA: National Science Foundation.



Strategic Variability

The study found nine multi-level systems change strategies related to investments in research, education, and outreach (e.g., leadership support, policies, programs, diversity, infrastructure, funding personnel, hiring personnel, building collaborative relationships, and training activities). The findings showed EPSCoR jurisdictions vary in their reported use of strategic activities as well as the program funding supported activities related to research, education, and community outreach or engagement. EPSCoR's investments in jurisdictions have traditionally been at the individual, project/team, or institutional level. Figure 2 shows how EPSCoR investment strategies occur at multiple levels. Based on findings from the 2M study, a 20-year view or longer is needed to see impact on jurisdictional research competitiveness.

Figure 2. EPSCoR jurisdictions invest in systems change strategies at multiple levels.



Outcome Variability

The study constructed a definition for research competitiveness that goes beyond EPSCoR eligibility and identified ways in which EPSCoR can positively impact other areas outside of increasing human capital and research infrastructure. Analysis suggested that EPSCoR jurisdictions can measure their programs across four outcome domains: Human Capital Production, Reputation in Knowledge Production, Economic Development, and Diversity in Labor Force. Further, jurisdictions with similar EPSCoR status clustered together across these domains. Outcome variability informed the five elements of AREC (resource acquisition, knowledge production, attractiveness, visibility/reputation, and economic development), and selected national Science and Engineering indicators illustrate where jurisdictions can leverage EPSCoR investments and achieve greater competitiveness over time.

Study Influence & Use

Aspects of the AREC model that surfaced from this study are reflected in the EPSCoR programmatic goals, logic model, key indicators in building STEM capacity, and response to the Envisioning the Future of NSF EPSCoR report. Henceforth, to further develop the AREC Framework, pilot implementation studies may examine the contribution of jurisdictional strategic choices to competitiveness outcomes at the cluster level. In addition to increasing their research competitiveness through federal investments in human capital and research infrastructure at selected postsecondary institutions, EPSCoR jurisdictions, state committees, and science and technology plans could consider additional investments that benefit the broader research system.

[Read the complete June 2022 2M Report here.](#)