

## Former ERC Boosts Economic Development of Mississippi

The Engineering Research Center for Computational Field Simulation (CCFS), located at Mississippi State University (MSU), was founded in 1990 and graduated from the ERC Program in 2001. The Center's mission was to reduce the time and cost of complex field simulations for engineering analysis and design by understanding the forces and flows around structures. Partners/clients included NASA, aerospace manufacturers, and automotive manufacturers.

This graduated ERC later evolved into the Institute for Computational Science and Engineering, a coalition of five independent centers that follow the ERC model of a cross-disciplinary team approach to strategically planned research. Subsequently, the Institute became the High Performance Computing Collaboratory (HPC<sup>2</sup>). This evolution is typical of graduated ERCs, which often respond to changes in their research field or industrial environment by shifting their focus and mission while still maintaining core features of an Engineering Research Center such as cross-disciplinary team research, a systems focus, and strong partnership with industry.



*The current outgrowth of the NSF ERC, HPC<sup>2</sup>, is a Collaboratory comprised of five interlinked research units.*

Collectively, this ERC has had an outsized impact on the economy of one of the nation's most economically depressed states. For example, one of the five centers in the HPC<sup>2</sup> is the Center for Advanced Vehicular Systems (CAVS). This Center has a research and development partnership with the Nissan Research Center in Japan based on Nissan's manufacturing investment in Mississippi—which in turn was a direct outgrowth of the former NSF ERC's work in computational design and process simulation. The Center also coordinates an engineering extension facility near the Nissan plant at Canton, Mississippi.

The Center reports that the direct research expenditures of its component units since 1990 have totaled \$410 million. The overall economic impact of the collective ERC, including R&D, employment, and product sales is estimated at over \$3B. The current Director reports that the graduated ERC, now HPC<sup>2</sup>, provides MSU with “a showcase for economic development activities that clearly demonstrates a commitment to and success in long-term planning and investment.”

**Table 1. Mississippi State University Economic Impact and Existing Industries 2005-2008**

<b>Performance Measures</b>	<b>CAVS Extension</b>	<b>Industrial Outreach Service</b>	<b>Technology Resource Institute</b>	<b>Center for Safety and Health</b>	<b>Franklin Furniture Institute</b>	<b>Total</b>
<b>Projects Completed</b>	41	84	223	920	100	<b>1368</b>
<b>Companies Visited</b>	39	66	187	665	90	<b>1047</b>
<b>Average # of Counties Impacted</b>	7	12	20	39	10	<b>88</b>
<b>Employees Impacted</b>	20,000	11,575		70,316	32,384	<b>134,275</b>
<b>Impact in Dollars</b>	\$3. Billion	\$19.57 Million	\$2.95 Million	NA	\$6.7 Million	<b>\$3.09 Billion</b>
<b>*TRI impact measured via client surveys.</b>						
<b>*CAVSE and IOS economic impacts as reported by clients and verified through a third-party independent assessment conducted by NIST-MEP</b>						