



In Search of a Safe Haven From the Gathering Storm

In its search for a science and engineering research project that could propel the Gulf Region to competitiveness in the global community, the Gulf States Alliance Steering Committee, comprised of representatives from Alabama, Louisiana and Mississippi, held the Gulf States Alliance: Network Science and Recovery Forum, on August 19-21, in Biloxi, MS. The following is the second in a series on the National Science Foundation EPSCoR-funded 2007 Gulf Coast Forum.

The abruptness with which the U.S. could lose its economic leadership in the world and, once lost, the challenge of recovering it, were among the findings and concerns laid out in the National Academies report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic future*.

That report, published in December 2006, has had more impact than any other in terms of providing direct results from the White House and Congress, according to Dr. Proctor Reid, Director, National Academy of Engineering Program Office. It was also the subject of his presentation to the 2007 Gulf Coast Forum.



Dr. Proctor Reid addressing the 2007 Gulf Coast Alliance Forum.

“Voicing concern that the country’s science and technology building blocks critical to economic leadership are eroding while many other nations are gathering experience, the Report cited two key challenges: 1) the creation of high quality jobs for all Americans, not just scientists and engineers; and 2) a response to the nation’s need for clean, affordable, and reliable energy,” said Dr. Reid.

Concerns pointed out by Dr. Reid included:

- The ‘Death of Distance’ — for skilled labor with the strong drive to succeed, a job doesn’t have to be in close proximity; it can be just a mouse click away.
- Will the U.S. be able to compete when great minds and ideas exist throughout the world — at a lower cost and a higher return to the investor?
- We need high-quality jobs to maintain our standard of living.
- The Federal government is not investing enough in basic fundamental research.

He also reviewed the Report’s four major recommendations and 20 implementation actions:

Ten Thousand Teachers, Ten Million Minds

- Recruit 10,000 teachers and educate 10 million minds. Attract bright students through competitive, four-year merit-based scholarships for B.S. degrees in sciences, engineering, or math with concurrent K-12 science and math teacher certification in exchange for five years public service teaching in public schools;
- Strengthen the skills of 250,000 current teachers via summer institutions, master’s programs and advanced placement/international baccalaureate (AP/IB) training;
- Enlarge the pipeline by creating opportunities and financial incentives for pre-AP/IB and AP/IB science and math courses;

Sowing the Seeds—Research, Researchers and Research Infrastructure

- Increase federal investments in long-term basic research by 10 percent a year for the next seven years, focusing on physical sciences, engineering, mathematics, information sciences and Department of Defense basic research funding;
- Provide 200 early career grants at \$100,000/year over five years;

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White House, Congressional Action Resulting from *Rising Above the Storm*

Dr. Proctor Reid attributed the following White House action to the National Academies report:

1) The American Competitiveness Initiative (ACI), for which the President committed \$5.9 billion in his FY 2007 budget to increase investments in research and development, encourage entrepreneurship, and strengthen education; and 2) the Advanced Energy Initiative, which provided an increase of 22 percent for clean-energy technology research at the Department of Energy.

“The President’s FY 2008 budget continued support for ACI, and included administrative actions on ‘deemed exports’ to protect national security and ensure the U.S. continues at the leading edge of innovation, and programs to bring international students, scholars and exchange visitors to the U. S.,” he said.

“Congressional action included the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education and Sciences (COMPETES) Act of 2007, which was signed by the President, and the 21st Century Competitiveness Act of 2007.”

Over FY 2008-2010, COMPETES authorizes \$33.6 billion for science, technology, engineering and mathematics (STEM) research and education and includes provisions to broaden participation in science and engineering fields at all levels.

“COMPETES keeps research funding at NSF, the National Institute of Standards and Technology (NIST), and Department of Energy (DOE) Office of Science on a near-term doubling path; establishes the Advanced Research Projects Agency for Energy at DOE to engage in high-risk, high reward energy research; and creates the NIST Technology Innovation Program to fund high-risk, high-reward, pre-competitive technology with high potential for public benefit,” he said.

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Gulf Coast Alliance Action Plan

Project Directors of the Alabama, Louisiana and Mississippi EPSCoR programs are planning a January 2008 follow-up meeting with institutional research officers to discuss the next step in developing an official Gulf Coast Research Alliance.

An Action Plan developed through input from Forum 2007 participants includes the formal organization of an LA-MS-AL research consortium to promote “big science” projects in the region; the initiation of a “Webinar” program in selected topical areas to expedite more faculty-to-faculty collaboration in the three-state region; an inventory of the region’s truly unique research infrastructure; and creation of a website with conference information via the LA EPSCoR website.

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- Institute a National Coordination Office for Advanced Research and Instrumentation and Facilities with \$500 million/year over five years;
- Catalyze high-risk, high-payoff research, allocating technical program managers eight percent of federal research agency budgets for discretionary funding;
- Institute a Presidential Innovation Award for scientific and engineering innovations in the national interest; and
- Institute an Advanced Research Projects Agency-Energy that focuses on out-of-the-box transformational energy research that industry by itself cannot or will not support.

Best & Brightest

- Increase the number of U.S. citizens earning science, engineering and math degrees with 25,000 new four-year undergraduate scholarships per year and 5,000 new portable graduate fellowships per year;
- Encourage continuing education of scientists with federal tax credits to employers;
- Provide international students and scholars less complex visa processing and extensions; one year automatic extensions for new PhDs in science and engineering and, if they find a job, an automatic work permit and expedited residency status; as well as skills-based, preferential immigration; and
- Reform the “deemed exports” policy and allow access to information and research equipment except to those under national security regulations.

Incentives for Innovation

- Enhance intellectual protection (IP) for the global economy while providing sufficient resources for the Patent and Trademark

Office, instituting a “first-inventor-to-file” system, shielding research uses of patented inventions from infringement liability, and changing IP laws that discourage innovation;

- Increase the research and experimentation tax credit from 20 to 40 percent of qualifying increase;
- Provide financial incentives so the U.S. is competitive for long-term innovation-related investments; and
- Affordable broadband access.

Report Conclusions

- There is a need to avoid the complacency of assuming the U.S. will remain competitive and pre-eminent in science and technology;
- The U.S. needs to renew its commitment to education, research, and innovation policies so the nation’s children will have high-quality jobs;
- Actions are needed not only at the federal level, but also at regional, state, and local levels.

For more information on the National Academies Report, go to www.nationalacademies.org/gatheringstorm, where a PDF of the executive summary and the full report are available at no cost.

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“It expands early career grant programs and provides additional support for young investigators at both NSF and DOE; strengthens interagency planning and coordination for research infrastructure and information technology, and puts the Manufacturing Extension Partnership on a path to doubling over 10 years.”

In terms of education, COMPETES authorizes competitive grants for new STEM courses or critical foreign languages leading to a bachelor’s degree with concurrent teacher certification; and helps provide thousands of new and current teachers with content and pedagogical expertise through NSF’s Noyce Teacher Scholarship and Math and Science Partnerships programs.

It expands NSF programs to enhance the undergraduate education of the future science and engineering workforce, including at two-year colleges, and authorizes competitive grants to expand access to AP/IB classes and to increase the number of qualified AP/IB teachers in high-need schools.

COMPETES also establishes a President’s Council on Innovation and Competitiveness to develop a comprehensive agenda to promote innovation and competitiveness in the public and private sectors and requires the National Academy of Sciences to conduct a study to identify forms of risk creating barriers to innovation.



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