Planning a Gulf Coast Natural Disaster Mitigation Initiative

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Introduction and Background

Initial discussions about opportunities for several universities and representatives from a number of business sectors, all located in several of the Gulf Coast states, to work together started with a meeting on April 25-26, 1999 in Atlanta. That meeting, organized by Florida State University President Sandy D'Alemberte, was attended by the Presidents or representatives of the University of Alabama, Georgia Institute of Technology, Louisiana State University, and Mississippi State University as well as several industry executives from the region. They discussed the possibility of a southeastern coastal research and economic development initiative.

The impetus for the meetings was the realization of momentous changes that are occurring in science and technologies that effect the economy and society at large. In particular

- it is increasingly recognized that the interdependency of technology and the economy is at the root of economic growth and jobs;
- the global economy is a fact today, with ease of movement of capital, jobs, and technology. This also accounts for increasing competition for ideas, human resources and a favorable political environment;
- climate and weather/storm forecasting is now capable of providing advanced knowledge for mitigating disasters, particularly droughts, in agriculture (El Nino) and personal property loss (hurricane and storm surges);
- information technology (IT) is becoming the key enabler of modern industry and academic disciplines and is an important reason for the rapid developments of new products and major cultural changes in our society;
- the widespread use of partnerships, collaboration and joint activities among industry establishments, industry-academic-government laboratories and the emergence of regional clusters mobilize regional resources that otherwise would stay untapped.
- while there are currently several national research centers focused on earthquake hazards, located from Buffalo, NY to Berkeley, CA, there are no comparable centers for the study of other natural disasters like hurricanes, tornadoes, floods, droughts, and fires in the Southeast. This is important as these natural hazards have a disproportionate impact on the Southeastern U.S. and the Gulf Coast.

The observation regarding partnerships in particular should be highlighted. Throughout the country "innovation, common innovation infrastructure, and geographic or end-product specific interconnected clusters"[1] are becoming vital elements of economic progress. Silicon Valley or Boston's Route 128 are no longer exceptions: the Research Triangle in North Carolina; the Potomac Region

[1] *The New Challenge to America's Prosperity: Findings from the Innovation Index*, Council on Competitiveness, 1999.

around DC; in Atlanta, San Diego, and the Seattle-Portland area—all are hotbeds of new industry, new developments with academia, industry and the states sharing the responsibilities and the success.

This proposal would bring together strong capabilities from universities and the private sector in the Gulf Coast states in a regional activity to the benefit of its citizens.

Regional Base

Four states, namely Florida, Alabama, Mississippi and Louisiana, share not only the Gulf coastal regions, but they share similar problems of natural disasters that have similar negative economic consequences. These natural disasters include hurricanes, tornadoes, and fires induced by natural phenomena that affect human lives, housing, recreation and the environment, and finally by droughts and wet conditions that impact agriculture.

These universities have strong backgrounds in computer and computational sciences, engineering, materials research, oceanography, and biological sciences. There are also specialties represented and being focused on that bestow a uniqueness to these institutions and worldwide recognition: Mississippi State University in simulation, visualization, and fluid flow research; Florida State University in climate and weather forecasting and computing; LSU in physics and environmental sciences; and the University of Alabama in marine and hydro-geology. The Georgia Institute of Technology will bring computing and engineering talents. These are only selected examples that omit many important areas, where the institutions have great competence and wide ranging distinction.

From an industry viewpoint, service industries—such as insurance, health, recreation, and manufacturing sectors, the building industry, enterprises such as information processing, marine related industries, agriculture—are foundations and a presence on which to build.

Another potentially important player must be mentioned: namely the numerous federal government installations in the region that are a source of capabilities and support.

Gulf Coast Natural Disaster Mitigation

Most natural hazards are impossible to prevent. They become disasters because of the vulnerability of people and structures. Natural disasters threaten every region of the United States. The costs to the nation in recent years have amounted to many tens of billions of dollars with several thousands of deaths. Fortunately, the losses and tragedies that result from natural disasters can be significantly reduced by programs of research, training, public policy formulation, and outreach. Such an effort, however, requires a systematic approach. Simply reacting, however effectively, to natural disasters is not enough. Growing knowledge and new capabilities allow us to anticipate and more effectively predict the frequency, duration, and severity of many of these natural disasters. The major focus of this initiative will be to provide and coordinate these new capacities, utilizing them to anticipate disasters more effectively, then assist in communicating this information to the appropriate public and private audiences.

Most recently, the country's attention has focused on droughts that are inflicting heavy losses in several disparate parts of the U.S. including the East, New England, and the Midwest. Last year, it was the Southeast, the Midwest, and the Southwest. It is clear that droughts bring tremendous loss in crops, in farming revenue, in consumer price increases, and in increasing numbers of human casualties. It is now possible to anticipate drought months in advance with knowledge gained from research and understanding of our oceans. The movement of warm and cold ocean waters in the Pacific and Atlantic Oceans dictate the behavior of atmospheric jet streams which

lead to anomalous weather patterns. Some promising progress has been made my studying El Nino and La Nina patterns in the Southeast. It is now prudent to better understand and predict the influences of various oceans on the climate of droughts in the southeastern U.S.
Business, industry and these universities that have joined in this initiative are located within a region of the United States that is vulnerable to a regionally-specific set of natural hazards, including several of the most costly events in American natural disaster history. These universities have strong Earth, Atmospheric, and Oceanographic Science and Engineering departments. They also have Agriculture, Forestry, Law and Public Policy, Sociology, Economics, Journalism and Media Departments, and Medical and Public Health Schools. These departments and schools are uniquely qualified to address pre-disaster preparation and post-disaster mitigation issues.

Among the most important natural hazards faced by the southeastern United States are hurricanes and their associated high winds, intense rainfall, storm surges, and flooding. Also, the region is plagued from time to time by coastal storms, tornado outbreaks, inland floods, droughts, agricultural blight, wildfires, and earthquakes. The vulnerability of the southeastern U.S. region to natural disasters will continue to increase because of the continuing migration of people to the coastal areas and urban centers and the Nation's dependency on its agricultural base.

Some of the consequences of natural disasters could be mitigated if the Gulf Coast region, comprised of Florida, Alabama, Mississippi, and Louisiana would systematize many of the effective programs that exist today in their universities, such as NOAA's weather warning system or the Central United States Earthquake consortium.

We propose, therefore, that the four states—through their universities, and in partnership with selected industries and key state officials—jointly investigate and plan the establishment of a **Gulf Coast Natural Disaster Mitigation Coalition**. Because of the diversity of the subject matter, the multiple sources of participation, and the availability of resources, we are proposing an initiative that

- will be jointly managed by participating universities with assistance from corporations and the cooperation of the participating states' development agencies and appropriate state officials;

- utilizes a "virtual research center" concept, physically located in the participating academic insttutions to be responsible for performing the anticipatory research and development as well as assisting in disseminating the results;

- will be overseen by a board responsible for policy, strategic planning, and execution; and

- will bring in other necessary expertise and collaborators to carry out these important activities.

The Coalition will conduct research as well as professional and public education activities to serve the citizens and the state governments of the region, as well as Federal agencies. Establishment of such a regional coalition would not only be of scientific, technical, and economic policy interest, but would also be a humanitarian undertaking by the universities to serve the populations in their states and neighborhoods.

Proposed Coalition Functions

The functions of the Coalition would include the following:

A. Research

The Coalition would foster research at its member institutions on the many dimensions of natural hazards issues. While there is extensive ongoing research on understanding and predicting weather and oceanographic phenomena, river floods, earthquake occurrences, agricultural blight, and forest conditions, there is insufficient research underway on improvements in public warning systems and post-disaster responses to them. While all states and most exposed communities working with the Federal Emergency Management Agency (FEMA) and other agencies such as NOAA and the National Weather Service have established community preparedness plans and post-disaster response systems, much research remains to be done on risk assessment for each hazard threat, providing forecasts to farmers and agricultural interests relative to planting and irrigation decisions, updating land use and building codes, taking into account disaster risk in investment decisions, estimating the true economic costs of natural disasters, and undertaking cost/benefit analysis of disaster mitigation policies. For example, recent breakthroughs in climate forecasting are benefiting numerous Florida farmers and energy suppliers. Economic impacts in this area related to farmers and agricultural consumers alone are estimated to be in the $200 million per year range.

B. Public Policy Formulation

Each state is faced with a host of issues related to disaster mitigation. In addition to putting in place updated relevant regulations such as land use and construction codes, there are questions that must be considered such as adequacy of enforcement measures, and assessing the effects of public and private insurance practices. Some private insurance companies approach the brink of bankruptcy following major disasters. Assuring sensitivity to disaster vulnerability in public and private investments is a fruitful field for research, as is training of emergency teams and adequacy of state and local government organizations for disaster mitigation.

C. Post Disaster Public Health

The statistics of morbidity, mortality, and disease associated with natural disasters reveal major needs. The destruction of community health infrastructures and the contamination of food and water supplies complicates care of the injured and threatens the survivors. The long-term health of particularly vulnerable segments of the population such as the aged and children become a major concern. Training of medical and public health personnel in post-disaster response is an important element of mitigation.

D. Professional Education

The Coalition would be in a position to work with state-level emergency management personnel, as well as local community emergency preparedness groups and to provide courses in pre-and post-disaster policies and actions. The policy research at participating and other universities makes an excellent basis for education and training for professionals in the disaster management field.

E. Public Education

Increasing public awareness and community preparedness are common goals of all states and communities. The Coalition, in cooperation with state and local emergency management agencies, is well suited to mount public education activities via television and other media, the Internet, school curricula, libraries, and other public outlets, including seminars and face-to-face demonstrations.

F. Data-Gathering Partnership

Discussions with the Gulf Monitor and Response Systems' Decision Support Systems, in conjunction with the U.S. Navy's Coastal Systems Station and the U.S. Air Force Research Laboratory, have been initiated. These groups are engaged in discussions with several federal agencies, including the Department of Defense and others, related to monitoring and instrumenting substantial portions of the Gulf of Mexico. The resultant data gathered by this initiative could be made available to the academic partners in the Natural Hazards Mitigation initiative for their use in analysis related to mitigating the various natural disasters under study. Such data could be invaluable in providing additional data for scientific purposes. The opportunities for future partnering and collaborations are considerable between the two groups and discussions will continue.

Rationale for Joint Action

It is not easy to bring an initiative like the one proposed into being. It is more difficult to do without a coordinated strategy, or without participation of various business and industry sectors, universities, or key state officials. The combined resources and visibility of the proposed partnership should make it possible to succeed and should shorten the time scale when the initiative reaches a significant state of accomplishment.

At the micro level, the benefit of establishing joint activities is clear. But also at the macro level, there are distinct advantages: a broader political base at the federal level is certainly one distinct advantage. Representatives from a number of states that share common objectives in resource allocation or in legislation are more prone to succeed together than in isolation from each other or worse, compete against each other. Thus, a key component of this initiative will be to strive to involve the academic, business and industrial sectors, and key state officials responsible for disaster response to make the most effective team possible.

Funding Request for Planning the Initiative

The Coalition requests $2 million to develop a full proposal. Funding would be utilized to bring all relevant players involved into planning, developing, and implementing this effort. A more detailed agenda for action, along with broad involvement in the planning, will be undertaken. Finally, substantive discussions with key federal officials related to potential funding sources have been and will continue to be undertaken, along with the acquisition of commitments for state and private funding partners.

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