



# **Research Assessment Program**

## **Fiscal Years 2009 and 2010**

**October 2010**



## Texas Higher Education Coordinating Board

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### Mission of the Coordinating Board

The Texas Higher Education Coordinating Board's mission is to work with the Legislature, Governor, governing boards, higher education institutions and other entities to help Texas meet the goals of the state's higher education plan, Closing the Gaps by 2015, and thereby provide the people of Texas the widest access to higher education of the highest quality in the most efficient manner.

### Philosophy of the Coordinating Board

The Texas Higher Education Coordinating Board will promote access to quality higher education across the state with the conviction that access without quality is mediocrity and that quality without access is unacceptable. The Board will be open, ethical, responsive, and committed to public service. The Board will approach its work with a sense of purpose and responsibility to the people of Texas and is committed to the best use of public monies. The Coordinating Board will engage in actions that add value to Texas and to higher education. The agency will avoid efforts that do not add value or that are duplicated by other entities.

This document is available on the Texas Higher Education Coordinating Board

Website: <http://www.thecb.state.tx.us>.

### For more information, contact:

Mr. Dale Cherry

Texas Higher Education Coordinating Board

P.O. Box 12788

Austin, TX 78711

512/427-6101

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## Table of Contents

Background .....	1
Review Process .....	2
Consultants' Reviews .....	3
Tarleton State University Tarleton Agriculture Center .....	3
Texas Tech University Emerging Technologies Research .....	6
Texas Tech University Health Sciences Center, Paul L. Foster School of Medicine Diabetes Research Center .....	12
The University of Texas at San Antonio Center for Water Research .....	15
Appendices	
A – Texas Education Code, Chapter 144 – Research Assessment Program.....	A-1
B – Letter from Legislative Budget Board .....	B-1
C – Research Assessment Program Self-Study Form .....	C-1
D – External Review Teams .....	D-1
E – 2010 Research Assessment Program Evaluation Form .....	E-1

## Background

The 70th Texas Legislature in 1987 established the Research Assessment Program (RAP) to evaluate special item funding for research projects at Texas higher education institutions. Chapter 144 of the Texas Education Code mandates a review by the Coordinating Board of separately budgeted research programs at Texas institutions of higher education (see Appendix A). The Legislative Budget Board (LBB) selects programs for review, and the Coordinating Board reports its findings to that body (see Appendix B).

The Coordinating Board is responsible for administering the RAP evaluations of selected research projects. Following the reviews, the Coordinating Board provides the report to the LBB. The report includes recommendations regarding the continuation of special item support of the reviewed projects.

For the 2010-2011 biennium, the Coordinating Board, in consultation with the Advisory Committee on Research Programs (ACORP), proposed to review four special items at four institutions. Three projects were located at general academic institutions, while the fourth supports a research venture at a health-related institution. In recognition of the state's current fiscal constraints, the four RAP reviews were conducted using out-of-state expert consultants via desk and phone review, rather than conducting site visits.

The four select special item research efforts total just under \$1 million annually in special item general revenue funding. The special item funding provides support for water, agriculture, emerging technologies, and diabetes research. The following projects were selected and reviewed:

	<b>FY 2009</b>	<b>FY 2010</b>
<b>Tarleton State University</b>		
Agricultural Research Center	\$246,084	\$246,084
<b>Texas Tech University</b>		
Emerging Technologies Research	\$333,305	\$333,305
<b>Texas Tech University Health Sciences Center Paul L. Foster School of Medicine</b>		
Diabetes Research Center	\$285,100	\$285,100
<b>The University of Texas at San Antonio</b>		
Center for Water Research	<u>\$131,250</u>	<u>\$131,250</u>
<b>Annual Total</b>	<b>\$995,739</b>	<b>\$995,739</b>

## **Review Process**

The four selected institutions were sent a self-study guide to prepare for their assessment. A copy of the self study guide is included as Appendix C. A complete copy of the individual self-study of each project is available upon request to the Coordinating Board's Division of Academic Affairs and Research.

Following submission of the institutions, self-studies, the Coordinating Board staff selected review teams of two experts per project to conduct the desk reviews. The Coordinating Board staff contracted with four expert review teams. Members of the review teams were identified as leaders in their field, and the institutions provided input into the selection process. Each consultant team conducted a desk review of one research special item program.

The review teams read the self studies and then held desk reviews via teleconferences. The institutions presented additional information and responded to reviewers questions during teleconferences. The desk reviews and teleconferences were completed in September 2010. The list of external reviewers for each research program is provided in Appendix D.

Following the desk review and institutions' presentations, the nationally-recognized reviewers prepared a written assessment of the projects and provided recommendations related to the projects continuation. The project evaluations addressed four criteria as specified in the statute: 1) intrinsic merit; 2) research performance; 3) development of knowledge and instruction in advanced and emerging technologies; and 4) economic development. Reviewers based their assessments on a scale that allowed for five rankings: excellent, very good, satisfactory, fair, and poor. Each project and the consultants' reviews are presented in the report. The evaluation form used by the review teams to assess each program is included as Appendix E.

The institutions had an opportunity to review and respond to the RAP evaluations of their projects. Each consultant review assessment is provided on the following pages.

## Consultants' Reviews

### Tarleton State University – Tarleton Agriculture Center

**Consultants:** David K. Beede, Ph.D.  
C.E. Meadows Endowed Chair and Professor  
Michigan State University, Department of Animal Science  
East Lansing, MI

Tony L. Brannon, Ph.D.  
Dean, School of Agriculture  
Murray State University  
Murray, KY

Funded Since Fiscal Year 2001  
Annual Appropriation: \$246,084

**Intrinsic Merit:                      Very Good**

The Tarleton Agriculture Center program is important regionally and statewide because its mission targets two key foci of commerce and research and development of the state agriculture production (and especially animal science / dairy production) and the emergence of bioenergy generation research and development. The program has, and intends to integrate further, these two foci in future research, teaching, and service efforts. In addition, the programs of the Agriculture Center support the teaching and outreach programs of Tarleton State University, which is well-respected regionally and nationally. With more than 1,400 students, it ranks high in undergraduate enrollment, both within Texas and across the nation.

The dairy industry is very notable in the area surrounding Tarleton, with Erath County ranking as the number one dairy production county in the Southwest United States. This intrinsic investment in dairy production, the pressing need for continued special emphasis to enhance and guard environmental sustainability in the region (Stephenville - Waco, Bosque River Watershed), and emergence of need for research and development in biofuel and energy generation are significant justifications to focus on and expand this program. This expansion has been part of the mission and vision of the university for approximately two years. The addition of the nearly completed Southwest Regional Dairy Center facility provides the strong programmatic foundation for additional investment to greatly leverage the research, teaching, and outreach programs (output, impact) of the Agriculture Center and Tarleton.

To date, it appears that major technical expertise, especially to generate research and development projects in the Integrated Bioenergy Recovery from Agriculture Wastes effort, has come most directly from private investors and entities. Efforts should be made to more fully

invest and engage faculty researchers in this subject area across the whole Texas A&M University System, as well as to develop even stronger intellectual and financial partnerships with the private sector.

Integration of the Dairy Center with the Bio-Energy Research Park documents significant intrinsic merit in the overall project. It will be very important in the immediate future to solidify and implement the objectives of the Dairy Center in the overall project to maximize its potential beyond simply being a “generator of dairy manure” for the biofuels/bioenergy research and development projects. Specific suggestions to enhance the research utility of the Dairy Center and its dairy production research aspects *per se* have been provided to the program.

The unit has established realistic goals and objectives through the years. However, we strongly recommend goal refinement and further development to align with the expansion of the Dairy Center and emphasis on bio-energy generation and capture.

Overall, in our opinion, the program is a good investment for Texas, but it has not yet achieved a regional, national, or international reputation for its work and impact. The prospect to reach national status appears good, if proper planning and investment between public and private sectors happen in the next several years.

**Research performance:                      Very Good**

The Agriculture Center is a multi-purpose program. Its mission is to develop, improve, and enhance programming for premier agriculture programs in teaching, research, demonstration, and outreach education. The center does not have specific research goals and objectives, but supports research by providing infrastructure that is used for both educational and research purposes for the College of Agricultural and Environmental Sciences. A review of the self-study document reveals areas of current research in Plant Science, Animal Science, Soil Science, Entomology, and Environmental Science. The list of on-going research projects in each of these areas is substantial. Emerging and expanding research opportunities are available as a result of the Bioenergy Recovery Research/Education Park and the new Southwest Regional Dairy Center.

Although all Tarleton faculty have a 100 percent teaching appointment with the university, several faculty are involved in research at the center and have produced publications, presentations, and master’s theses, with about 90-95 percent of these generated through Agriculture Center research. Agriculture faculty at Tarleton are engaged in center research, but where faculty research expertise is lacking, partnerships have been and continue to be formed within the Texas A&M University System and/or with private sector companies. The college has a strong collaboration with the Texas AgriLife Research and Extension Center.

Based on a review of recent Master’s theses and publications listed in the self-study, it appears that, overall, Tarleton’s research programs have been reasonably productive. Greater strength is

noted in the fact that considerable private and public investment has been made recently in Bioenergy Recovery Research projects.

**Knowledge and Instruction:       Very Good**

The Bioenergy Recovery Research/Education Park and the new Southwest Regional Dairy Center provide a terrific opportunity for development of new knowledge and instruction in advanced and emerging technologies. This likely represents the most prevalent opportunity that this college has to help the region move forward.

The expanded emphasis on these areas provides an excellent avenue to take the research back into the classroom and impact a future generation of the new workforce.

**Economic Development:           Very Good**

Tarleton and the Agriculture Center provide a significant boost to the economic development of the region. Specifically, the university is the largest employer in the area, and a research study indicated that it contributes about \$157 million in economic activity for the region and \$223 million for the state of Texas. This economic impact of Tarleton is attributed, for the most part, to its service related activities and programs, which are primarily presented at the university's Agriculture Center and supported directly or indirectly via special item funding. Doubtless, the university's economic impact can grow substantially in the future as research programs in energy and dairy are expanded. Additionally, Erath County agriculture contributes about \$200 million annually to the area, and the county's dairy industry annual revenue of about \$140 million makes it the state's largest dairy producer (Economic Impact of Tarleton State University, Jafir, S. H.A. et al., 2004).

Research emphasis and activity is centered on wealth creation and environmental sustainability as well as job creation. Furthermore, Tarleton's College of Agricultural and Environmental Sciences contributes much to the economic development of the region through training of graduates to be the qualified workforce of the future.

The Agriculture Center operates with a diverse and successful Advisory Committee. The college should also leverage with private partnerships to expand operations, given the appropriate budgetary considerations.

**Recommendations**

It is paramount to refine, develop and enlarge the current Strategic Plan to provide a clear guide for the future and to define enticements to garner new initiatives and investments for the unit.

The program should be continued and expanded, and it would benefit from more public and private participation through the development of additional intellectual and monetary partnerships. These are keys to continued success in the next five years and beyond.

The Agriculture Center will need a significant influx of new public and private funding to support their ambitious goals and objectives. Funding for this program should be continued and increased to strengthen the potential for success in research efforts and public-private partnerships and to capture the potential regional and state-wide benefits of the recent investments in the Southwest Regional Dairy Center and the Bioenergy Recovery Research/Education Park.

Publication of research results from the center in both scientific publications and lay publications should increase in the future as opportunities for more research projects occur with expanded capabilities of the Dairy Center and integration with the biofuel and energy generation thrust of the overall Agriculture Center. Furthermore, a more defined mechanism than that apparent to the reviewers should be established to ensure the most relevant research topics for the region are addressed at the center.

Continue to expand opportunities for undergraduate and graduate research at the center. Incorporate the activities and research at the Dairy Center into the teaching curriculum of the Southern Great Plains Dairy Consortium Teaching, of which Tarleton is a cooperating member. These potential practical, experiential learning activities should include both those associated with the modern large-style dairy production and management unit, as well as system management related to nutrient and environmental management and bioenergy generation. This could be a one-of-a-kind opportunity for undergraduate and graduate students not available anywhere else in the U.S.

### **Texas Tech University -- Emerging Technologies Research**

**Consultants:** Hilary H. Ratner, Ph.D.  
Vice President for Research  
Wayne State University  
Detroit, MI

Lawrence B. Coleman, Ph.D.  
Professor of Physics  
University of California, Davis, Davis, CA  
and Former Vice Provost for Research,  
University of California System

Funded Since Fiscal Year 2001  
Annual Appropriation: \$333,305

The four initiatives that make up the Texas Tech University (TTU) Emerging Technologies special item funding are diverse in their approaches, but focused on the common goal of enhancing the Texas economy through innovation and workforce development. Overall, the initiatives united

under the program appear to be meeting their objectives and are making positive contributions not only to the success of the university, but also to the quality of life for Texas citizens.

### **Emerging Technologies Research, Initiative I: Technology Commercialization**

**Share of Annual Appropriation: \$138,203**

<b>Intrinsic Merit:</b>	<b>Very Good</b>
<b>Research performance:</b>	<b>Very Good</b>
<b>Knowledge and Instruction:</b>	<b>Very Good</b>
<b>Economic Development:</b>	<b>Very Good</b>

Bringing the results of university research to the marketplace is not a simple process. In addition to the basic research that produces intellectual property, it is incumbent upon any university to demonstrate to the private sector the commercial viability of the technology. Funding for this additional research and applied study is typically difficult to obtain. The research is too far "upstream" from product development to attract industry support, yet it is too applied and product focused for the typical research grant. The small fund available through this initiative has been key in assisting TTU in the demonstration of commercial viability of several projects. Faculty projects that have been assisted by awards from this program have attracted significant extramural funding, and licenses have been or are in the process of being negotiated, indicating that the return on investment and the contribution to economic development are very good. An important positive feature of this initiative is that the availability of this type of funding encourages faculty to consider the commercialization potential of their own research.

Other positive features of this initiative are:

1. Administrative support for the initiative is provided by campus resources so that all initiative funds are invested directly in faculty projects.
2. Of the three faculty funded in 2009-2010, two are Associate Professors and thus at a critical point in their careers. This award pattern signals to and reinforces with faculty that considering the commercial aspects of their research is important.
3. Students are fully engaged in this applied research and thus become additional intellectual resources for the State of Texas. Involvement of students indicates connections between the research and academic programs of the institution.

### **Recommendations**

The review consultants have one recommendation to strengthen this initiative. Currently, the selection process of projects and faculty is carried out internally by the Office of Technology

Commercialization. Although this process is not flawed, we believe the program would be enhanced by the creation and use of an advisory group that would include industry leaders and faculty with innovation and entrepreneurial experience. Such an advisory group would not only provide valuable feedback to the initiative leaders, but also the opportunity for outreach to both campus and off campus constituencies and potential contributors.

**Emerging Research Technologies, Initiative II: College of Human Sciences Texas  
Workforce Research**

**Share of Annual Appropriation: \$68,983**

<b>Intrinsic Merit:</b>	<b>Very Good</b>
<b>Research performance:</b>	<b>Very Good</b>
<b>Knowledge and Instruction:</b>	<b>Very Good</b>
<b>Economic Development:</b>	<b>Very Good</b>

This program provides seed funding to faculty who are new to TTU to help support the launching of their academic and research careers at the university and to leverage funding in key areas of importance to economic and workforce development in Texas.

Particular topics were emphasized so that projects in critical areas will produce outcomes that will contribute to improving workforce development. These topics represented investments either in developing human capital at different points in the life-span or in areas that will contribute to an ever expanding knowledge-based economy. For example, awards were made in areas such as career development, financial planning, and retirement which are aimed at developing human capital during different phases of adulthood, whereas projects related to early childhood development, family mental health, and Head Start focused on investments that can be made earlier in the life-span. Research has shown that children who have stronger experiences early in life are more likely to be productive adults and less dependent on state and federal social services later in life. As a result, knowing even more about this important phase of life is critical to workforce development in the future. Other projects were focused on areas such as nanotechnology that will provide innovations for the new economy based on advanced manufacturing and technology.

Thirteen awards were made in 2009 and 10 awards were given in 2010. These awards were small grants of approximately \$5,000 and were allocated primarily to assistant professors just beginning their academic careers. Some funds, however, were also made available to more senior faculty who were more advanced in their careers but were new to the university and Texas. Funds were often used to support a research assistant to collect preliminary data that were critical to proposals for outside funding. Although the level of funding for these 10 projects was small, the yield was high, producing a return of approximately 10 times the investment in

2010. Greatest success occurred in projects focused on nanotechnology, early cognitive development, and family mental health which have already led to over \$600,000 in federal research funds and at least one patent application.

These funds will produce not only outcomes that will have implications for strengthening workforce and economic development, but will also support graduate students, and integrate research and academic programs. In addition, the ability to secure external funds and apply for patents provides independent evidence of the quality of the projects supported and the intrinsic merit of the program, along with the significance of the program for economic development. Between 2008 and 2010, 45 publications have resulted from awards in this program. This level of productivity is a good record of achievement and, again, provides independent evidence of the strength of the projects funded.

### **Recommendations**

The review consultants have two suggestions for consideration. Although successful outcomes have resulted from a small investment in each project, additional advantages might be gained if fewer but larger awards were made. Interdisciplinary, problem-based science will only continue to expand in the future, and seed funding that better positions faculty to compete for these types of grants might strengthen both the academic and research enterprise. For instance, students who are trained as part of these types of teams will be better prepared for either professional or academic careers. Awards that bring together faculty teams across departmental and disciplinary boundaries may also lead to the creation of interdisciplinary academic programs or concentrations, again benefiting not only the research itself but the academic programs that are based on strong research.

In addition, it is particularly important to ensure that research and academic outcomes of this program are communicated to legislators and the broader public. There may be a communications plan in place that includes dissemination of information to target external audiences, but, if not, it will be important to create one. The connections between program outcomes and economic or workforce development may be less obvious, but no less critical, than for other initiatives, such as I and III.

### **Emerging Research Technologies, Initiative III: The Texas Wine Marketing Research Institute**

**Share of Annual Appropriation: \$126,119**

<b>Intrinsic Merit:</b>	<b>Very Good</b>
<b>Research performance:</b>	<b>Very Good</b>
<b>Knowledge and Instruction:</b>	<b>Very Good</b>

**Economic Development:****Very Good**

Of the four initiatives included in the Emerging Technologies Research Program, the Texas Wine Marketing Research Institute most directly enhances the Texas economy and contributes to economic development in the state. The Texas Wine Marketing Research Institute (TWMRI) is funded in part from these funds and serves the State of Texas and TTU in research, teaching, and public service to advance the Texas wine industry, clearly establishing its intrinsic merit. Unlike the valuable work of the agriculture extension and viticulture and enology department that serve the grape commodity and wine production communities, the TWMRI serves to bring the marketing expertise of TTU faculty and students to support this growing Texas industry. Acting as a center of market research, the Institute provides valuable information to the grape and wine industries in addition to individual wine producers and the retail and travel industries.

As an academic center, faculty and students associated with the TWMRI have produced a significant number of refereed journal publications and research reports demonstrating high quality research performance.

The Institute takes on the additional role of building partnerships among TTU, the Texas Department of Agriculture, the Texas wine industry, and researchers at other universities in Texas and around the world. Moreover, the Institute is successfully integrated into the TTU academic enterprise by contributing undergraduate courses in Wine Tourism and Wine Marketing and have used part of the funding to support two graduate students who are conducting research dedicated to improving the marketing of the Texas wine industry, demonstrating that the initiative supports knowledge and instruction in advanced technologies.

The review consultants note that of the four initiatives, this is the only one that allocates part of its funding to provide direct salary support of center administration.

**Recommendations**

As with all four initiatives, the review consultants would recommend that the TWMRI reach out to industry for additional support. For the TWMRI, the consultants can see opportunities for industry and commodity group funding of faculty research and student internships along with small scale research projects, such as the highlighted student review of winery web sites. Student interns would be ideal to assist marketing efforts of younger (but adult) Texans, particularly through the use of social networking and other new modalities.

**Emerging Research Technologies, Initiative IV: Graduate Fellowship Initiative****Share of Appropriation: \$0****Program Allocation from ARRA Funds: \$4,000,000 (\$1.32 million expended in FY 2010, \$2.68 million in FY2011)**

<b>Intrinsic Merit:</b>	<b>Very Good</b>
<b>Research performance:</b>	<b>Very Good</b>
<b>Knowledge and Instruction:</b>	<b>Very Good</b>
<b>Economic Development:</b>	<b>Very Good</b>

The objective of this initiative is to provide funding for graduate student research fellowships in areas critical to the growth of innovation and intellectual capital. Primary emphasis is in STEM (Science, Technology, Engineering, and Mathematics) fields, although additional fellowships have been allocated to the social, economic, and behavioral sciences, along with business and humanities, which are also relevant to innovation and economic development. These fellowships not only support new knowledge and technology relevant to economic development, but also strengthen the research and academic programs of the university. The ability to attract high quality graduate students to a program improves both teaching and research performance, which in turn enhances recruitment of even stronger faculty. Intrinsic merit of the program is evident and very good.

Approximately 170 fellowships have been provided thus far. Some fellowships have been awarded to master's students as well as doctoral students. The fellowships are intended for recruitment of new high quality students rather than for support during later phases of a student's program. Students are recruited with the stated requirement that the student and the department apply for continuing funding from external grants, either from funded graduate fellowships or via a research assistantship as part of a grant awarded to their faculty mentor. Several external awards have already been secured, providing evidence of excellence in research performance and independent assessment of the high quality of the program.

### **Recommendations**

Fellowships are awarded to departments for student recruitment, and decisions concerning allocations appear to be made by the Provost and the Vice President for Research, with some assistance from the Dean of the Graduate School. The reviewers recommend that the Graduate School be fully integrated into the decision making process and that the Dean have responsibility for monitoring the quality of the outcomes of the program. We recommend that a strong assessment program be developed so that it is clear that the program objectives are being met. Data need to be collected so that TTU can be assured that the funds are being used to attract students who might not otherwise attend the institution.

Information on number of offers made, number of offers accepted (to determine yield), and student quality (e.g., GRE scores, grades, undergraduate research performance, etc.) would represent some appropriate selection measures. As students matriculate through their graduate programs, information on retention, time to degree, time to qualifying exams, research

productivity, and graduation rate would provide a basis for evaluating student and program success. Faculty mentors should also be evaluated for research and mentoring productivity. Those overseeing the program should also consider whether fellowships might be used to enhance diversity so that under-represented groups either because of ethnicity, nationality, or gender are increased.

Unless an assessment program is established now, it will be difficult to track student performance and determine the success of the initiative. The review consultants would also suggest that awards only be made to master's students in programs in which the master's is the terminal degree or in programs in which the student earns the master's as part of the doctoral program.

**Texas Tech University Health Sciences Center, Paul L. Foster School of Medicine –  
Diabetes Research Center**

**Consultants:** Howard Davidson, Ph.D.  
Assistant Professor, Pediatrics  
Barbara Davis Center for Childhood Diabetes  
University of Colorado Denver  
Aurora, CO

Elena V. Rios, M.D., M.S.P.H.  
President and CEO  
National Hispanic Medical Association  
Washington, DC

Funded Since Fiscal Year 2002  
Annual Appropriation: \$285,100

Diabetes is a major public health problem on the West Texas Border and in rural areas of Texas generally. The Hispanic community for yet unknown reasons has a higher incidence of diabetes than the rest of the U.S. The Texas Tech Diabetes Research Center was formed to enable research on diabetes-related conditions in the El Paso region, with the vision to improve the quality and multidisciplinary nature of diabetes research by providing shared access to specialized technical resources and expertise.

Center staff has produced two collaborative grants this year with colleagues at The University of Texas at El Paso to develop research and educational programs for improvement of health-related resources for low-resource settings such as the West Texas Border. The center has work ongoing and has published in the area of metabolic abnormalities associated with obesity and reversals of these derangements following rapid weight loss. This has produced insight into the mechanisms of metabolic change associated with obesity-related diabetes. The center is

incorporating this funding into development of a larger Center of Excellence in Diabetes and Obesity. The growing research programs are expected to stimulate economic activity by creating a demand for educational attainment in the community and by creating well-compensated employment.

**Intrinsic Merit: Satisfactory**

The Texas Tech Diabetes Research Center represents an important endeavor that provides benefit to an under-served population in combating a disease with major socio-economic consequences both regionally and nationally. As such, it remains a good investment for Texas. The program has realistic goals and objectives that have remained unchanged since its inception. Some structural deficiencies were noted that have negatively impacted the quality of the work being done. However, there appears to be clear institutional commitment to improve and expand both the infrastructure and research faculty. This suggests that many of these deficiencies should soon be remedied, which should in turn lead to an enhanced reputation for the center both regionally and nationally. Similarly, a plan is in place to improve the existing administrative practices that are currently deficient in areas such as defining center membership, recording member usage, and acknowledging center support.

**Research performance: Fair**

Past research performance of the center is judged to have been quite modest, likely in part due to the extremely limited infrastructure available. However, the recent appointment of Dr. Charles Miller as Interim Director has revitalized the program and provides considerable hope that its full potential will soon be realized. In particular, Dr. Miller and Dr. Daniel Terroros, Professor of Pathology, have shown significant success in leveraging a portion of the additional funds necessary to expand the research base and put in place a plan to focus the center's efforts on meeting the needs of its unique clients. Moreover, the institutional commitment to elevate the center into a "Center of Excellence" also bodes well for its future success, provided that the ongoing search for a suitable director is successful.

**Knowledge and Instruction: Satisfactory**

The successful applications for federal support have led to a significant increase in student involvement in this aspect of the center. In particular, the development of a collaborative graduate student program in bio-engineering with The University of Texas at El Paso provides a key mechanism for expanding knowledge and instruction in emerging technologies. The decision to focus on developing novel devices for point of care testing, portable field laboratories, and improved diabetes mini-pumps is considered especially appropriate since the targeted programs will service the needs of the center's clients and should create a unique identity. At present, the graduate program operates as a remote site for the Texas Tech University Lubbock campus, and the planned development in the medium term of an independent program is encouraged.

**Economic Development:                      Satisfactory**

The Texas Tech University Diabetes Research Center makes a small but significant contribution to the economic development of the state that has the potential to increase substantially when the Diabetes and Obesity Center of Excellence comes to fruition. In particular, the recently established collaborative graduate program has already facilitated the transfer of results from the program's research to industry, and this can also be expected to increase in the future. However, the program currently lacks a satisfactory mechanism for assessing that all of the needs of local businesses are being served, and the establishment of a suitable advisory committee is therefore encouraged.

**Recommendations:**

The reviewers are concerned that the current budget is focused almost exclusively on the funding of salaries. A diversification is recommended to include line items for costs associated with obtaining and processing samples for the bio-bank, supplies support for undergraduate and post-graduate research project, student bursaries for summer projects, travel and associated costs for increased community outreach (including both social and business communities), and potentially one or more pilot grants. It is felt that funding of such items from the center budget would make it easier to demonstrate the direct involvement of the center in these activities in any subsequent review process.

In summary, the reviewers feel that the new leadership and institutional support for significant expansion of diabetes and obesity research provide the center with considerable potential to establish a national reputation and make significant contributions to both the economic and educational development of the currently under-served community in which it is based. However, the recruitment of a high profile director is considered key to the fulfillment of this promise.

## **The University of Texas at San Antonio -- Center for Water Research**

**Consultants:** Ray E. Finley  
Department Manager, National Security Applications  
Sandia National Laboratories  
Albuquerque, NM

David Jordan, PE  
Senior Geohydrologist  
Intera, Inc  
Albuquerque, NM

Funded Since Fiscal Year 2001  
Annual Appropriation: \$131,250

The Center for Water Research (CWR) at The University of Texas at San Antonio (UTSA) was originally established in 1987 using a grant from the National Science Foundation (NSF). The focus of the CWR is to use applied methods to address water supply and water quality issues in Central and South Texas, the United States/Mexico border region, and Central America. CWR also serves as a coordinating agency and central repository for integrated watershed management. It also has established working relationships with numerous communities within its focus area. The CWR seeks to form partnerships with other universities; institutes and centers; local, state, and federal governments; and non-profit agencies. The CWR is committed to providing educational opportunities throughout a variety of topic areas related to water supply and water quality. These include geology, civil and environmental engineering, biology, chemistry, environmental science, and computer science. The CWR seeks to fill a current and future need for water resources professionals within its focus area, and accomplishes this via its degreed students.

Noting the importance of the water/energy nexus, the CWR of late seeks to align itself with the Texas Sustainable Energy Research Institute (SERI), and focus its activities more towards the specific challenges associated with the strong ties between water resources and energy generation.

**Intrinsic Merit:      Very Good**

The CWR is a strong regional program that supports and provides research and educational opportunities in the area of applied water resources. The CWR seeks to develop holistic approaches to providing turnkey water-supply solutions to historically under-served communities throughout Central and South Texas, the United States/Mexico border region, and Central and South America.

The program is involved with a wide variety of research topics and activities, including:

- Carbon sequestration;
- Martian geology and atmospheric;
- Surface-water studies and modeling;
- Remote sensing;
- River geomorphology;
- Rainfall estimation;
- Water treatment;
- Biofuels;
- Cold region studies;
- Fisheries biology;
- Alternative energy;
- Cetacean biology;
- Water systems in developing areas;
- Contaminant transport; and
- Water-related educational support.

While the list of research topics covered by the CWR researchers is impressive, it indicates that more focus may be needed within the program. During the interview process for this review, it became clear that there are some distinct areas of interest for the program, although these are not necessarily apparent from the broad array of research being performed. These areas of interest include:

- Development of turnkey water-supply systems for rural and developing communities;
- Small-scale energy projects that could be used to power these supply systems; and
- Serving as a United States point of contact/technical coordinator for water sustainability and education for Latin America.

While the review consultants believe that the intrinsic merit of the CWR is very good, it also appears that greater focus, strategic planning and intent would benefit the program.

**Research performance:    Very Good**

The CWR serves as a focal point for water research and does this by coordinating and leveraging opportunities through faculty members in various departments across the university. A strong list of publications was provided across the very diverse range of technical areas described above. However, some of the research topics do not align well with the strategic vision of the CWR.

The review consultants would suggest that (as described above) the CWR concentrate on developing a clear and well-articulated strategy, which should be used to focus its efforts on those particular research areas that align with the strategy and to encourage/recruit faculty and collaborators and even externally-funded research. This would allow the CWR to focus its impact on those areas of greatest relevance to the CWR's mission.

**Knowledge and Instruction: Satisfactory**

The CWR has demonstrated their strong knowledge base in some specific technology areas, particularly, surface-water studies and modeling, river geomorphology, water treatment, water systems in developing areas, water-related educational support, and contaminant transport. This is evidenced by the number and scope of the externally-funded projects and sponsors. The CWR focuses on providing opportunities for master's level students and provides a number of yearly stipends as well as serving as a coordinator for connecting students with faculty in various departments across the university. The CWR points out that they have a strong record of serving the Hispanic community students and have a strong record of providing service to underserved communities in Texas, Mexico, South America, and Central America. It is unclear what specific instruction the CWR performs, although the director is active in teaching in his department. Through external outreach, the CWR provides that service to the community by participating and coordinating workshops and seminars, and by providing "as-needed" technical services to municipal and government organizations.

As described above, the review consultants believe that the CWR could enhance its impact in this area by providing a strong focus and strategic direction. This would allow the CWR to focus its efforts on those technical services that most align, and will allow the CWR leadership to better market their associated faculty/students and personnel.

**Economic Development: Satisfactory**

The CWR has done a good job of leveraging the funding they receive via special item funding from the Texas Legislature by a factor of almost 10 times. They also serve a very important regional/local function in providing technical assistance for customers, thus improving their economic competitiveness. Also, they have developed strong international relationships with Mexico, South America, and Central America that improve the economic competitiveness in those regions. Locally, they serve as an entity that provides unbiased "honest broker" expert assistance to utility and other customers in the area. This service provides economic development assistance that is difficult to measure, although it would be helpful for the CWR to make such estimates for these types of services in the future.

Because of the lack of clear metrics, a clear strategic plan or business plan, and lack of focus, it is difficult to determine the specific level of economic development that the CWR has enabled. As discussed above, directing the CWR to estimate these impacts would be an important directive in future evaluations. We believe that the CWR provides an important service to the community and region, and believe that the economic impact cannot be measured directly by funding coming into UTSA or CWR, but rather in the impact of the water quality and sustainability in the regions that they serve.

## Recommendations

Overall, we believe that the CWR serves a very useful function for UTSA, the State of Texas, the United States/Mexico border region, and Latin America. The CWR has distinguished itself over nearly 25 years of service, and has assisted in the education of many students and professionals. It has assisted in integrating water resource management technologies across multiple university departments. The CWR serves both a local and international function, has published broadly across a diverse range of technology areas, and has assisted in a myriad of technical projects for a wide range of customers. This is a vital technical area and is well suited to be directed at UTSA.

We believe that the CWR can enhance its impact by the following:

- The program needs more focus;
- While there is a plethora of interesting applied work being completed that focuses around some specific focus areas, these focus areas need to be articulated more clearly;
- The current approach for identifying and funding research topics is ad-hoc, and needs to be sharpened via strategic focus, intent, and follow-through;
- CWR can enjoy more control over the research topics that it focuses on by specifying what projects it will fund, based on the strategic plan that it develops;
- CWR should seek to use its advisory board more for strategy development, and develop performance metrics;
- It may benefit CWR to seek support from other sources within the UTSA community for support in strategic planning. This may include the UTSA College of Business or other similar sources;
- The CWR should develop a strategic partnership with the Texas Sustainable Energy Research Institute (SERI) with a strong mission statement, or risk being subsumed by SERI; and
- CWR should work more strongly with the educational departments to define what role(s) they can play in education. There must be strategic intent in their educational engagement.

# Appendix A

## TEXAS EDUCATION CODE

### CHAPTER 144. RESEARCH ASSESSMENT PROGRAM

#### Sec. 144.001. DEFINITIONS.

In this chapter:

- (1) "Assessment program" means the research assessment program established under this chapter.
- (2) "Coordinating board" has the meaning assigned by Section 141.001 of this code.
- (3) "Research program" means research conducted by separate research divisions, including research bureaus or institutes and separately budgeted or financed research investigations, that is subject to evaluation and review under this chapter, but does not include departmental research not separately budgeted or financed or contract research and services.
- (4) "Institution of higher education" has the meaning assigned by Section 61.003(8) of this code.

Added by Acts 1987, 70th Leg., ch. 823, Sec. 3.08, eff. June 20, 1987.

#### Sec. 144.002. ESTABLISHMENT; PURPOSE.

The research assessment program is established to provide for biennial review and evaluation by the coordinating board of all research programs in all public institutions of higher education.

Added by Acts 1987, 70th Leg., ch. 823, Sec. 3.08, eff. June 20, 1987.

#### Sec. 144.003. GUIDELINES AND PROCEDURES.

- (a) The coordinating board shall appoint an advisory committee consisting of representatives of higher education and private enterprise and other experts in relevant research areas to review and evaluate the research programs.
- (b) The coordinating board with the advice of the advisory committee shall develop guidelines and procedures to evaluate the research programs for intrinsic merit, research performance, and the potential contribution of the research to the development of knowledge and instruction in advanced and emerging technologies and the economic growth of this state.

Added by Acts 1987, 70th Leg., ch. 823, Sec. 3.08, eff. June 20, 1987.

**Sec. 144.004. REPORT OF FINDINGS.**

(a) Not later than September 1 of the second year of each biennium, the coordinating board shall report to the Legislative Budget Board the preliminary findings of the advisory committee's assessment conducted under this chapter and make recommendations concerning reauthorization, revision, or discontinuation of each research program.

(b) The Legislative Budget Board shall determine the schedule for the review of the research and technology programs that are subject to biennial review and evaluation under this chapter.

Added by Acts 1987, 70th Leg., ch. 823, Sec. 3.08, eff. June 20, 1987.

## Appendix B



### LEGISLATIVE BUDGET BOARD

Robert E. Johnson Bldg.  
1501 N. Congress Ave. - 5th Floor  
Austin, TX 78701

512/463-1200  
Fax: 512/475-2902  
<http://www.lbb.state.tx.us>

May 10, 2010

Raymund Paredes  
Commissioner of Higher Education  
P.O. Box 12788  
Austin, TX 78711

Dear Commissioner Paredes:

We have reviewed the schedule of research special items to be reviewed under the Research Assessment Program as required by Chapter 144 of the Education Code, as proposed in your letter of April 30, 2010.

We agree with the list of special items proposed for review during the 2010-11 biennium, and will revisit the items to be reviewed during the 2012-13 biennium after the 82<sup>nd</sup> Legislative Session.

If you need additional information regarding this matter, please contact Greg Owens at 463-1219.

Sincerely,

A handwritten signature in black ink, appearing to read "JOHN O'BRIEN".

John O'Brien  
Director

Mailing Address: P.O. Box 12666 • Austin, TX 78711-2666

## Appendix C

Texas Higher Education Coordinating Board

### 2010 Research Assessment Program Self-Study

Completed Self-Studies are due to the Coordinating Board by July 15, 2010. See page 12 for details.

Name of Program:	Director:
Name of Institution:	
Program Mailing Address/ Telephone/Fax/E-Mail:	Name/Address/Telephone/Fax/E-Mail of Person to whom questions concerning this document should be addressed:
Executive Summary (200-word description of mission, objectives, benefits to State):	
Director Signature:	Authorized Institutional Representative Signature: Title:
Date:	Date:

## Program Summary

	FY2009 Dollars	FY2010 Dollars
Special Item Expenditures (see Part III.3.)		
External Support: (see Part IV.3.)		
Federal Research		
Federal Other		
Industrial Research		
Private or Foundation		
State and Local Agency		
Other		
Licensing Income (see Part IV.6.)		
	FY2009 Number	FY2010 Number
Personnel Receiving Support (FTE's): (see Part II.3.)		
Faculty		
Professional Staff		
Support Staff		
Students		
Publications: (see Part IV.8.)		
Journal Publications		
Conference Proceedings		
Technical Reports		
Theses (MS or Ph.D.)		
Other		
Intellectual Property: (see Part IV.4. and 6.)		
Patents Filed		
Patents Awarded		
Copyrights Filed		
Copyrights Issued		
Public Service: (see Part IV.12.)		
Workshops		
Symposia		

## PART I - RESEARCH MISSION AND HISTORY

1. Check the box which most closely describes your program:  
Facility Operation  "Mini" Granting  Other   
Research Unit  Public Service Organization
2. Describe the goals and objectives of the research activities of this program.
3. When was this program created and by what action? Attach a copy of the enabling action, e.g., statute, Board of Regents minute order, etc.
4. When did the program first receive special item funding? (Indicate any interruptions in state funding). If the program existed prior to receiving special item funding, what was the source of funding?
5. What was the purpose of the program when it was created?
6. How has the purpose of this program changed since it was created?
7. List other programs in Texas with comparable goals and objectives and comment, to the extent possible, on the similarities and differences.

## PART II - ORGANIZATION STRUCTURE AND OPERATIONS

1. Provide an organization chart that shows how the program fits into the university structure.
2. Provide an organization chart that shows the major functional components of the program.

3. Personnel Summary

Provide a list of all individuals who received financial support from the program during fiscal year 2010. Include name, full/part time (%), and status (faculty, other professional staff, support staff, students). If more than 12 people were supported, show the number and full-time equivalent (FTE) of each category of employee. If the program is new, show projected staffing for FY2011.

FY2010

<u>Name/Title</u>	<u>Status</u>	<u>Percent Time</u>
-------------------	---------------	---------------------

4. How is the special item program integrated into the academic program of the institution? Include a description of student exposure to or participation in advanced or emerging technologies as a result of this program.

5. Describe the administrative mechanism(s) used to develop program focus and priorities.

6. Does the program have an advisory group? If so, provide a list of members, dates convened during 2009 and 2010 and most significant contributions to the program to date.

7. Who are the program's clients, how are they identified, and how are their needs determined?

8. How does the program contribute to the economic development of Texas?

**PART III - FINANCIAL SUMMARY**

Attach a completed copy of the research program's Legislative Budget Board Appropriations Request forms for FY2010-2011 to this report. Be sure it includes the "SPECIAL ITEM SUPPLEMENTAL INFORMATION" page.

1. Budgets for FY2009 and FY2010
2. Budget Summary Table FY2009 to FY2010

Fill in the table below. If data are not available for specific entries, provide estimates and indicate them with asterisks (\*).

Source of Funds:	FY2009	FY2010	FY2011 (est.)
Special Item			
Other State Support			
Federal			
Private			
Other			
Total Operating Budget for Entity			

3. Expenditure of Special Item Funds FY2009 and FY2010

Fill in the table below. If data are not available for specific entries, provide estimates and indicate them with asterisks (\*).

	FY2009	FY2010
A. Personnel		
Faculty		
Professional Staff		
Support Staff		
Students		
B. Permanent Equipment		
C. Travel		
D. Facilities, Rent		
E. Other Direct Costs		
Total		

## PART IV - PROGRAM OUTCOMES

This section requires information about the results of the program's activities.

Please complete all sections that are appropriate.

1. Briefly describe the program's three most significant research accomplishments during FY2009 and FY2010.
2. List any major collaborative research associations with other programs or organizations during FY2010.
3. List external support received for FY2009 and FY2010.

	<u>Period Covered</u>	<u>Source</u>	<u>Total</u>	<u>Amount</u>
--	-----------------------	---------------	--------------	---------------

- a. Federal research
  - b. Federal other
  - c. Industrial research
  - d. Private and foundation
  - e. State and local agency
  - f. Other
4. Patents filed and/or issued in FY2009 and FY2010.
  5. Copyrights filed and/or issued FY2009 and FY2010.
  6. Licensing income received in FY2009 and FY2010. List separately, identifying sources.
  7. Describe commercializations of program-developed technologies which occurred in FY2009 and FY2010.
  8. List of publications based on program's research effort during FY2010, including those in press. Put an asterisk next to the refereed publications. If more than ten in any category, briefly describe them instead of providing a list.
    - a. Journal Publications
    - b. Conference Proceedings
    - c. Technical Reports
    - d. Theses (indicate M.S. or Ph.D.)
    - e. Other

9. List website urls or attach up to five reports from news agencies or other external groups that highlight the program's research activities.
10. List names, companies, and locations of students supported by the program who accepted industrial positions during FY2009 and FY2010.
11. List visiting scientists who participated in the program during FY2010. (Give institutional affiliation).
12. Public service in FY2010. List workshops, symposia etc.

**PART V - FUTURE ACTIVITIES**

1. Do you expect to request continued special item funding for FY2012-2013 and subsequent biennia?

No

Yes, how much? \_\_\_\_\_

2. Describe the major opportunities facing the program in the next five years.
3. Describe the major problems facing the program in the next five years.

**Submit completed self-studies to the Coordinating Board by July 15, 2010**

**E-mail** completed survey to Dale Cherry by July 15, 2010 at:

Dale.Cherry@theccb.state.tx.us

**And mail** original signed survey to:

Dale Cherry  
Program Director  
Texas Higher Education Coordinating Board  
P. O. Box 12788  
Austin, TX 78711-2788  
Phone: 512/427-6224

Overnight mail address:  
1200 East Anderson Lane  
Austin, TX 78752

# Appendix D

## EXTERNAL REVIEW TEAMS

### Diabetes Research Center

Howard Davidson, Ph.D.  
Assistant Professor, Pediatrics  
Barbara Davis Center for Childhood  
Diabetes  
University of Colorado Denver  
1775 Aurora Ct.  
Aurora, CO 80045

Elena V. Rios, M.D., M.S.P.H.  
President & CEO  
National Hispanic Medical Association  
1411 K Street, Suite 1100  
Washington, DC 20005

### Emerging Technologies Research

Hilary H. Ratner, Ph.D.  
Vice President for Research  
Wayne State University  
5057 Woodward, Suite 6409  
Detroit, MI 48202

Lawrence B. Coleman, Ph.D.  
Professor and former Vice Provost for  
Research  
Department of Physics  
University of California Davis  
One Shields Avenue,  
Davis, CA 95616

### Tarleton Agriculture Center

David K. Beede, Ph.D.  
C.E. Meadows Endowed Chair and Professor  
2265K Anthony  
Dept. of Animal Science  
Michigan State University  
East Lansing, MI 48824-1225

Tony L. Brannon, Ph.D.  
Dean, School of Agriculture  
Murray State University  
Applied Science Building  
103 S. Oakley  
Murray, KY 42071

### Center for Water Research

Ray E. Finley  
Department Manager, National Security  
Applications  
Sandia National Laboratories  
P. O. Box 5800, MS 0706  
Albuquerque, NM 87185-0706

David Jordan, PE  
Senior Geohydrologist  
Intera, Inc  
6000 Uptown Boulevard, NE  
Suite 220  
Albuquerque, NM 87110

## Appendix E

Texas Higher Education Coordinating Board

### Research Assessment Program

#### 2010 Evaluation Form

<b>Program Reviewed:</b>			
<b>Program Contact Person:</b>			
<b>Reviewer:</b>		<b>Date:</b>	

Chapter 144 of the *Texas Higher Education Code* describes the Research Assessment Program. Under this program, the Texas Higher Education Coordinating Board is charged with reviewing separately-budgeted research programs under a schedule determined by the Legislative Budget Board. The legislation specifies that four aspects of these programs shall be evaluated: intrinsic merit, research performance, potential contribution of the research to the development of knowledge and instruction in advanced and emerging technologies, and the potential contribution to economic development. The following are working definitions of each of these criteria. Because of the heterogeneous nature of the programs evaluated under the Research Assessment Program, evaluators may find it necessary to enlarge on these criteria.

**Intrinsic merit** – the importance of the problem to Texas, technical excellence, capabilities of the investigators, quality of facilities.

**Research performance** – the research output of the program as measured by publications, leveraging of funds, new discoveries and other developments.

**Knowledge and instruction in advanced and emerging technologies** – the program’s potential to create new knowledge and the integration of the program in the institution’s academic program.

**Economic development** – the importance of the program to the economic base of the state, potential for technology transfer, patents and copyrights, human resources development, leveraging.

Evaluators are encouraged to address all aspects of the program being reviewed, but it is requested that these four criteria be specifically addressed in the written comments. In addition, it is requested that a rating be provided for each of these criteria. The following ratings should be used:

**Excellent** One of the best programs in the nation.

**Very Good** A quality program that may be of value to the State but not yet of national stature.

**Satisfactory** A program that is making positive contributions but could be expected to do better.

**Fair** A program that has serious deficiencies that should be addressed.

**Unacceptable** A program that has substantial deficiencies and should be discontinued.

**Intrinsic Merit****Rating:** \_\_\_\_\_

Questions that may help you address this topic:

1. Does the program have realistic goals and objectives?
2. Have the program's goals and objectives changed since inception? If so, were these changes appropriate and in the best interests of the state?
3. Is the program fulfilling its stated objectives?
4. Is the program responsive to its clients' needs?
5. Is the work being done of high quality?
6. Does the program have a highly-qualified staff?
7. Are the administrative practices of the program appropriate?
8. Is the program well thought of regionally? nationally? internationally?
9. Is a program such as this a good investment for Texas?

**Comments of evaluators:****Research Performance****Rating:** \_\_\_\_\_

Questions that may help you address this topic:

1. Has the program made a substantial contribution to new knowledge?
2. How would you rate the performance of the program regarding publications?
3. How would you rate the performance of the program regarding leveraging of funds?
4. Does the program have a mechanism to ensure that it focuses its efforts on the most relevant research topics?
5. Does the program have a mechanism for actively disseminating the results of its research?

**Comments of evaluators:**

**Knowledge and instruction in advanced and emerging technologies**

**Rating:** \_\_\_\_\_

Questions that may help you address this topic:

1. Does this program focus its efforts on advanced and emerging technologies?
2. Is the program making substantial contributions in this area?
3. Is the program integrated into the academic program of the institution?
  - is the research being done by faculty and students or by professional staff?
  - is the research relevant to the instructional program of the institution and being incorporated into it?
4. Does the program have the potential to contribute to the development of knowledge and instruction in advanced and emerging technologies?

**Comments of evaluators:**

**Economic development**

**Rating:** \_\_\_\_\_

Questions that may help you address this topic:

1. Are the results of the research program important to the economic development of the state?
2. Does the program have a process for disseminating the results of its research?
3. What evidence is there that the program is contributing to the economic development of the state?
4. Does the program encourage patents, copyrights, and commercialization of its research results?
5. Is there evidence that students from the program transfer the results of the program's research to industry?
6. Does the program have an advisory committee or other mechanism for assessing the needs of the industry or group being served?
7. Is there evidence of industry support?
8. Does the program have the potential to contribute to economic development?

**Comments of evaluators:**

**Other comments you wish to make:**