Algae for Fuel

AgriLife Research investigates renewable energy potential

**BY BLAIR FANNIN**

In a College Station laboratory, Dr. Tryston Wickersham opens a white canister and reveals a green powdery substance with a fishy odor. “Our goal is to be the first to feed it to cattle,” says Wickersham, a Texas AgriLife Research animal nutrition scientist, discussing how the dried powder produced from algae could be used as part of a cattle feed supplement. After drying and extracting the oil from the algae, biofuel producers are left with a high-protein powder that could soon become an ingredient for feeds. With a crude protein content as high as 30 percent, not only does it have the potential to become a valuable supplement for cattle, but also a protein source for shrimp and redfish, which is currently under study. “We’re actively determining nutritive value and, more specifically, the concentrations of carbohydrates, amino acids and minerals,” Wickersham says. For beef cattle, there’s anticipation that algae co-products could be fed as a protein supplement, both as a grazed cattle and in feedlots. “It would definitely give them an alternative source of nitrogen,” Wickersham says. “What we are working on now is identifying any components that add value to it. Historically, nitrogen has been one of the primary limiters of agricultural productivity, thus resulting in nitrogen being expensive. Using algae as a source of nitrogen/protein in cattle diets has the potential to reduce the cost of beef cattle production, especially when fed in combination with other feed ingredients that are low in nitrogen/protein. Ultimately, this should translate into reduced production cost and increased efficiency.”

This AgriLife Research project is one of several related to algae taking place across the state. “With algae, there’s a myriad of potential applications,” says Bob Avant, program director for AgriLife Research. “Our research is for several projects that could very well lead to some new, cutting-edge developments used in areas that we never thought possible.”

Continued on Page 6

A&M-Corpus Christi professor tracks migration of bull shark

**BY STEVEN PASCHAL**

On a beautiful October day Dr. Greg Stunz cruises the Padre Island National Seashore in a four-wheel-drive vehicle with two of his graduate students. They stop each time they encounter a National Geographic film crew documenting his efforts for a future television program.

Stunz breaks from chatting with a competitor to take a call on his cell phone. He learns that several miles away a bull shark has taken the bait and a four-man crew has secured it in the wet sand where the tide delivers life-sustaining water. He quickly goes about his work, oblivious to the National Geographic film crew documenting his efforts for a future television program.

The scientist inserts an acoustic tag into the shark’s abdomen, while another researcher takes a tissue sample, and a third team member records the time, location and size of the shark. The fish is headed back to open water within minutes, unaware that it has just become a swimming transmitter whose movements will be tracked by receivers strategically located at inlets and estuaries along the Texas Gulf Coast.

Stunz, holder of the endowed chair for fisheries and ocean health, and associate professor of marine biology at the university’s Harte Research Institute for Gulf of Mexico Studies, is an expert on fish migration. Global and regional trends suggest alarming declines in shark populations due to overfishing. Limited understanding of shark population parameters such as species composition, movement patterns, nursery areas and habitat use can limit recovery. The purpose of his A&M-Corpus Christi professor tracking migration of bull shark.

Continued on Page 6

Forest Service helps predict the unpredictable

**BY REBECCA WAFFS**

Historic levels of dryness have sparked one of the worst wildfire seasons Texas has ever seen. Wildfires have consumed more than 1.9 million acres, destroyed 400 homes and resulted in the deaths of two volunteer firefighters. Forecasters continue to warn of current weather and fuel conditions being ripe for massive and destructive wildfires.

Between 2005 and 2010, 10 wildfires were documented. It takes the perfect mix of low relative humidity, strong winds, an abundance of dead grass and other weather factors to produce the Southern Plains Wildfire Outlook pattern. Conditions are favorable when that pattern develops during the winter and spring in the Southern Plains, an area that spans from eastern New Mexico east to the Dallas-Fort Worth area, and from Kansas south to the Texas Hill County. While three wildfires have been declared this year, Texas responders have been battling other blazes spanning hundreds of thousands of acres and causing similar devastation.

“The threat is still here. We’re not out of the woods yet,” says Spencer. “We need to continue to get the word out because weather conditions indicate we could be facing this threat for some time.”

Texas Forest Service communications manager Linda Moon and communications specialist Holly Huffman contributed to this article.

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A fire burns through the Davis Mountains in West Texas as part of a burnout operation set by Texas Forest Service and interagency firefighters.
Notes from the Chancellor

Michael D. McKinney, M.D.

Like most Texans, all of us in higher education are keenly aware of the many demands placed upon the state budget and how that might impact us and our mission. As a former legislator, I know that our state lawmakers have an extremely tough job ahead of them and that my job right now is not to make theirs more difficult. So, we will do what we need to do to meet the budget requirements, mindful of the challenges we all face. But be advised, the cuts are painful.

From my perspective as chancellor, I have always found that the best time to make the really tough, hard structural decisions is during times when the budget situation is challenging. It forces us at The Texas A&M University System to look back at our mission and re-examine who we are as a system.

Because this is just such a time, we have re-examined our priorities while addressing budget issues and making strategic realignments. Before the crisis arrived, we at the A&M System had already begun the search for “shared services” to improve the efficiency of operations at the system and at each of the universities and agencies. At this point, I have no doubt that we must continue to focus our energies and resources on the following key priorities:

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News Briefs

Economic impact of Texas A&M, A&M System in Brazos Valley exceeds $3 billion

The economic impact of members of the Texas A&M System headquartered in Bryan/College Station is estimated to surpass $3.7 billion annually, an increase of more than $213.4 million from 2010. The in-house study, conducted by Texas A&M University’s Division of Finance, shows that the A&M System has a direct impact of nearly $1.5 billion on College Station, Bryan and surrounding areas, an increase of more than $85.3 million compared to the previous year.

Texas Forest Service and A&M-Central Texas sign shared services agreement

The Texas Forest Service and Texas A&M University-Central Texas have signed a shared services agreement formally recognizing an active commitment to increasing efficiencies, reducing expenses and building partnerships among members of the A&M System. A&M-Central Texas will provide office space to TFS personnel in exchange for land management on the university’s 672 acres. This includes preparing a land management plan with annual updates, placing firebreaks around the perimeter of the property and performing periodic dozer activities.

A&M System recognized for HUB usage

Nine members of the A&M System were among the top 25 Texas agencies for purchasing goods and services from companies certified as Historically Underutilized Businesses in fiscal year 2010, according to the Fiscal 2010 Annual Report for the Statewide Historically Underutilized Business Program issued by the state comptroller’s office. Texas A&M International University was the top state institution, spending more than $5 million a year, with 64.28 percent of its total eligible expenditures spent with HUB vendors; West Texas A&M University was fourth with 51.79 percent; and Texas Transportation Institute was eighth with 38.66 percent. Texas A&M University was 10th with 38.22 percent. The A&M System’s HUB numbers were higher than the state average of 15.9 percent, and institutions of higher education’s average of 19.27 percent.

Texas Transportation Institute opens new test chamber

The Texas Transportation Institute has opened the largest drive-in environmentally controlled test chamber in the nation. The new chamber will work best as the demographic landscape changes and the school environment evolves. Our goal is simple: to give Texas students the very best education they can receive so that we can prepare them effectively as a chancellor. I look forward to the support we receive from the public and universities and to develop the next generation of Texas leaders.

Preparing the next generation of students.

We must increase and properly train the next generation of teachers so that we can enhance the quality of our public education system and the caliber of the next generation of students it produces. The A&M System already graduates more Texas teachers in the state. We find, train and employ our teachers on behalf of the students, parents and taxpayers of the state and try to serve as a model for both practical and theoretical advances in education for other systems and universities. We are continually determining best practices for the preparation of teachers today and also shaping the future workforce best as the demographic landscape changes and the school environment evolves. Our goal is simple: to give Texas students the very best education they can receive so that we can prepare them effectively as a chancellor.

Research and discovery.

One of our fundamental missions is to advance knowledge through research and turn discoveries into innovative solutions that improve the lives of Texans, while ultimately solving some of the world’s most pressing problems. As a purely pragmatic issue, the A&M System’s externally funded research expenditures exceeded $712 million last year, which had a highly significant economic impact on the state. Without this research focus, Texas would find it difficult to continue to attract new business and funding and would eventually lose ground in the increasingly competitive global marketplace. That is totally unacceptable. This institutionalized curiosity on the part of our faculty is the underpinning for all great universities. The teaching and modeling from our faculty prepare the next generation of creative problem solvers.

As I wrote at the outset, there will be no complaining; we do what we need to do to make the budget work. But, I also pledge to continue at every opportunity to remind our legislators that the Texas A&M System plays a critical role in the economic stability, security, health and well-being of our state and that is the reason why the state continues to invest in our universities. This is part of the fulfillment of our obligation to the citizens of our great state.

Six Inducted into Chancellor’s Academy of Teacher Educators

The Texas A&M University System recently announced the creation of the Chancellor’s Academy of Teacher Educators to recognize individuals who have made significant contributions to teacher education and to highlight the role of the A&M System in producing K-12 teachers for Texas. The inaugural inductees were recognized during the Chancellor’s Century Council’s annual meeting in April. Academy members each received a $1,000 stipend, commemorative medallion and certificate.

The first class of the Chancellor’s Academy of Teacher Educators was selected by an A&M System committee; future classes will be selected by Academy members. University faculty, staff and students may nominate any full-time faculty member who has had a significant impact in the preparation of teachers.

“Teachers have shaped the past and now shape the entire future of our state and our nation” says Michael D. McKinney, chancellor of the A&M System. “The Texas A&M System is dedicated to producing outstanding teachers who will stay in this honorable field of endeavor. This initial class of inductees into the Academy all share a devotion to the teaching profession and a commitment to today’s students and tomorrow’s leaders.”

FIRST CLASS Inaugural inductees of the Chancellor’s Academy of Teacher Educators are (from left) Dr. Lance Kieffer, West Texas A&M University; Dr. Patricia Zelman, Tarleton State University; Dr. Cherie A. McCollough, Texas A&M University-Corpus Christi; Dr. Marian Henry, Prairie View A&M University; Dr. Dawn R. Parker, Texas A&M University; and Dr. Jasquita A. Cranfill Hargus, Texas A&M University-Texarkana.

Red Dress Exhibit on Display at George Bush Presidential Library

The Heart Truth Red Dress exhibit will be featured through Aug. 14 at the George Bush Presidential Library and Museum in College Station. The exhibit features red gowns and suits worn by celebrities and America’s First Ladies Dr. Laura Bush, Dr. Barbara Bush, Dr. Rosalynn Carter, Dr. Betty Ford and Dr. Nancy W. Davis, wife of President George H.W. Bush.

Women will be selected for the Texas A&M, A&M System in Brazos Valley exceeds $3 billion

Texas A&M University; and Dr. Jauquita A. Cranfill Hargus, Texas A&M University-Texarkana.
Research, Academia and Experience

Rescue and Recovery in Japan Highlights A&M System Collaboration

By Rebecca Watts

When a 9.0 magnitude earthquake hit Japan on March 11, 2011, researchers from six Japanese universities could do nothing but watch from College Station as the ensuing tsunami engulfed their homes. The resulting tsunami has caused more than 14,500 deaths, and more than 10,000 people remain missing. In addition, damage caused to the earthquake and tsunami resulted in severe leaks from three nuclear reactors, which has caused global radiation panic.

The Japanese researchers were eager to return and offer the assistance of their recently tested rescue robots. They had spent two days in Texas Engineering Extension Service’s Disaster City® testing and training the latest in robot concepts and technology in cooperation with Texas A&M University’s Center for Robot-Assisted Rescue and Recovery. Dr. Robin Murphy, one of the nation’s leading experts in rescue robotics and Raytheon professor at Texas A&M, said robots could play a critical role in rescue and recovery operations in Japan.

Murphy, director of the Center, arrived in Japan on April 3 to provide guidance and assistance in using robots for recovery efforts. CASAISR is a crisis response center and research organization at Texas A&M that directs and stimulates robotic technologies and research for humanitarian aid and serves existing rescue organizations, such as the International Rescue Systems Institute in Japan. Through the program Robotics Without Borders, the Center offers the newest technologies from universities, industry and private individuals at no cost for insertion into natural and man-made disasters.

“We send out only proven devices, ones that we’ve seen work at Disaster City® or during building demolitions. We try to match the best robots with the needs, then monitor the performance which helps better catalog what’s working, and what’s not working — what new technology is needed in training to the international teams...”, Murphy says. “The real goal is to have these robots adopted by responders and then we can start working on improving them.”

TExEER works with Murphy and other experts from around the world to evaluate, improve and refine robot technologies and concepts by providing the nation’s top experts in urban rescue and recovery, and the use of Disaster City®, a 52-acre training field that includes full-scale replicas of the types of collapses and rubble caused by the earthquake and tsunami in Japan.

EXPLORING DISASTER The KOHGA3 robot is equipped with three CDC cameras, a thermal camera, laser scanner, LED light, altitude sensor, gas sensor and one-meter long robotic arms. The International Rescue Systems Institute is using KOHGA3 to explore damaged structures in the aftermath of the earthquake and tsunami.

“It’s not just having the rubble and these high-fidelity collapses,” Murphy says. “It’s also having the responders. They are so much better than the average responder because they do so much work for the U.S. Department of Homeland Security. They are very adept at evaluating technology and also very gentle about giving feedback.”

Murphy said it was through the partnership with TExEER that rescue robots have been effectively evaluated for disaster situations and in some cases sent back to the drawing board. TExEER houses Texas Task Force 1, the state’s primary urban search and rescue team under the direction of the Governor’s Division of Emergency Management. The team’s experience in matters of life and death has been honed by leading all search and rescue efforts for state. The collaboration between Texas A&M, the Texas Engineering Experiment Station and TExEER offers a setting for training that Bob McKee, director of TExEER Disaster Preparedness and Response, chief of Texas Task Force 1 and director of Texas Emergency Support Function-II, says can’t be found anywhere.

“Because we collaborate, we offer a unique set – academia, research and practical – that makes Disaster City® and The Texas A&M University System the leader in search and rescue training,” says McKee.

Rebecca Watts is a communications specialist for The Texas A&M University System Office of Communications.

Palo Duro Research Facility Increases Lab Space at WTAMU

By Rana McDonald

The stark white walls, high ceilings and cement floors may fit the mold of a typical research lab, but the 20-foot contraption that sits just off center of the large open room is a far cry from the usual lab paraphernalia. The apparatus made of sheet metal, wood and Plexiglas is connected in an assortment of shapes and sizes, and could easily pass for a play tunnel at the local park or fast food restaurant. But it is actually a wind tunnel and a key component in air-quality research at West Texas A&M University.

The tunnel wouldn’t fit in many of the research labs at WTAMU, but thanks to a recent $1.5 million grant from the U.S. Department of Commerce’s Economic Development Administration, the university was able to turn the former Palo Duro Hospital into a research facility. The grant funds were matched by the university, and the newly constructed building is now home to the University Research Alliance offices, the Alternative Energy Institute and several spacious research labs.

ROOM TO STUDY DeOtte uses a velocimeter to measure wind operations in wind tunnel.

Dr. Robert DeOtte, professor of engineering, recently moved into one of the labs at the Palo Duro Research Facility. It offers him more than enough room to set up the cumbersome wind tunnel for research on dispersed aerosols and particles to improve rural air quality.

“The wind tunnel was donated to us by Los Alamos National Labs,” says DeOtte. “It’s been boxed in pieces here and there, so it’s nice to have the space to put it together and working. The tunnel runs at wind speeds of 24 kilometers per hour. The Environmental Protection Agency sets the standards for these with configurations for more urban areas. I want to double that to 48 to 50 kilometers per hour for wind speeds that are more common to our area.”

The apparatus—a aerodynamic particle size, global sizing velocimeter, vibrating orifice aerosol generator, towers, and meteorological instruments—will measure velocity fields, particle and droplet sizes, and aid in DeOtte’s research to seek solutions for environmental problems associated with production agriculture. When DeOtte, who works in collaboration with researchers at Texas AgLife Research, gets these configurations working, he can compare data with wind speeds and densities in rural areas, which will provide important information for agriculture.

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Dr. Stephen Safe, distinguished professor of toxicology at the Texas A&M University, Texas A&M College of Veterinary Medicine & Biomedical Sciences and the Institute for Biotechnology at the Texas A&M Health Science Center, along with Dr. Mandip Sachdeva, professor of pharmaceutical sciences with the Florida A&M University College of Pharmacy, has received a grant from the Department of Defense – Army Breast Cancer Research Program for their project entitled “The Role of Novel Substituted Dipyrrinone Analogs in the Treatment of Triple – Negative and Erbb2 – Positive Breast Cancer,” which was funded at $1.4 million over four years.

Texas A&M University – Kingsville was awarded a $1.5 million grant in 2010 from the Texas Commission on Environmental Quality and Environmental Protection Authority to fund environmental engineering projects aimed at reducing water pollution in the lower Rio Grande Valley. Funded projects are expected to construct six wastewater collection systems for irrigation and septic purposes, and one constructed in a rearing and wetlands. The Lower Rio Grande Valley Stormwater Taskforce, an organization of 15 cities and towns in the Valley, will manage the projects with the university.

Texas A&M is one of five collaborating institutions awarded an $18 million National Institutes of Health grant for research aimed at developing nanotechnology-based therapeutics and diagnostic tools for treating heart and lung diseases. The “Integrated Nanosystems for Diagnosis and Therapy Award” is one of four Programs of Excellence in Nanotechnology funded by the National Heart, Lung, and Blood Institute. The award will support five years of nanoparticle-focused research.

Research Briefs

Dr. Tracy Hammond, assistant professor in the Texas A&M University Department of Computer Science and Engineering, received a 2010 Defense Advanced Research Projects Agency Information Processing Technologies Office (IPTO) award to design a remote system to assist in the rapid reassembly and reorganization of decommissioned vehicles on the ground after airborne deployment. The IPTO funds innovative research in advanced information science, technology and systems that will have direct impact on current and future national security needs.

Dr. Magesh Thyagarajan, director of the Plasma Engineering Research Lab and an assistant professor of engineering in the College of Science and Technology at Texas A&M University-Corpus Christi, has received a $780,000 research grant from the U.S. Department of Defense to establish a state-of-the-art Plasma Engineering Research Laboratory (PLER). The award from the Army Medical Research and Materiel Command-Telemedicine and Advanced Technology Research Center allows the PLER, which is part of the university’s biomedical engineering program, to carry out atmospheric pressure “cold plasma” based biomedical engineering research for military care medical treatment applications.

The “Integrated Nanosystems for Diagnosis and Therapy Award” is one of four Programs of Excellence in Nanotechnology funded by the National Heart, Lung, and Blood Institute. The award will support five years of nanoparticle-focused research.
Recent Appointments

KENT KELSO was named vice president for student engagement and success at Texas A&M University. Texarkana by The Texas A&M University System Board of Regents in February. Kelso will be responsible for the development and management of services, programs and activities designed to enhance student engagement and success including student life, enrollment management, counseling, student retention services, and first-year experience services and programs.

RODNEY MCCLENDON was appointed vice president of administration at Texas A&M University at Galveston and senior vice president for operations at the University of North Texas. McClendon will oversee facilities services and operations, transportation services, university police, and risk and compliance. He holds a Bachelor of Business Administration from Morehouse College; a Ph.D. in agricultural leadership, education and policy from Texas A&M; and Doctor of Jurisprudence degree from Emory University School of Law.

ROBERT SMITH III was appointed vice president at Texas A&M and president/ chief executive officer at Texas A&M University at Galveston by the Board of Regents in February. Smith previously oversaw Houston operations as senior vice president of the Federal Reserve Bank of Dallas. He has nearly 35 years of service in the U.S. Navy. Smith holds a Bachelor of Science degree in agricultural economics from Texas A&M and is a graduate of the School of Banking of the South at Louisiana State University. He also attended the John F. Kennedy School of Government at Harvard University, completing studies in national and international security. He earned a Doctor of Business Administration from Texas A&M and its Galveston campus and currently serves as chairman of the President’s Council of Advisors and is a member of the advisory board for the Department of Finance.

WILLIE F. TROTTY was appointed vice president for research and development and dean of the graduate school at Prairie View A&M University by the Board of Regents in September 2010. The appointment is a return to the position Trotty left in 1998 to serve as vice president for research and development. Under his leadership, the graduate school experienced noted growth in graduate enrollment and helped secure major funding for several of the university’s research interests.

KARAN L. WATSON was named provost and vice president for academic affairs at Texas A&M by the Board of Regents in March. Watson, who also holds the title of Regents Professor in the Department of Electrical and Computer Engineering, has held increasingly responsible leadership positions at Texas A&M since joining the faculty in 1983. She served as vice provost for strategic initiatives from 2008 until 2009, and dean of faculties and associate provost from 2002 until 2009. Before assuming the position of dean of faculties and associate provost, Watson served as associate dean for graduate studies in Texas A&M’s Dwight Look College of Engineering. She earned her bachelor’s, master’s and Ph.D. in electrical engineering from Texas Tech University.

In March 2009, expectant father Dr. Sukesh Aghara filled the long hours waiting on his son’s arrival preparing a research proposal. “I was in the hospital room working on this proposal,” says Aghara, an assistant engineering professor at Prairie View A&M University. Six days after his son was born, Aghara submitted the proposal to the National Science Foundation for the creation of a Center for Research Excellence in Science and Technology at PVAMU. A year later, he found out his efforts had earned a $5 million grant for the establishment of the Center for Energy and Environmental Sustainability.

In March 2009, Dr. Robert F. Jackson, Texas A&M University-Corpus Christi, will oversee facilities services and operations, transportation services, university police, and risk and compliance. He holds a Bachelor of Science degree in environmental sustainability from Texas A&M. He also attended the John F. Kennedy School of Government at Harvard University, completing studies in national and international security. He earned a Doctor of Business Administration from Emory University School of Law.

PVAMU Seeks Role in Energy Landscape

BY CHRISTI LANTRY

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ENERGIZING RESEARCH Aghara, who will oversee the establishment of the Center for Energy and Environmental Sustainability, works in his laboratory with a liquid separation column used in nuclear fuel cycle research.
TEEX and Tarleton partnership improves forensic training  

BY HEIDI HARD

On a wintry December day, Texas Forensic Science Academy students attending a skeletal death investigation class don protective booties and gloves to begin processing two death investigation scenes. The scenarios are staged, but the subjects being investigated are actual remains privately donated to the Forensic Anthropology Center at the Texas State University Body Farm in San Marcos.

The sites, one protected by a tent containing buried skeletal remains left underground for three years, and the other, an open site containing remains decomposed above ground before being buried, serve as the student’s field evidence lab for the week. Orange twine stretched in a grid pattern over each site provides a reference for photography and evidence removal. Each five-member team is required to remove all skeletal remains through proper excavation and documentation.

“The agreement with Tarleton helps to move Texas closer to establishing formalized training standards for forensic technicians and investigators, with the ultimate goal of providing better justice through better science for all,” says Tom Shehan, TEEX public safety and security director. “This landmark agreement is beneficial to the university, TEEX and the state of Texas,” says Tarleton president F. Dominic Dottavio. “Tarleton is proud to work with TEEX to continue its tradition of producing highly qualified and highly trained criminal justice students.”

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Law enforcement personnel can complete one or two classes to develop new skills, or earn one of several TFSA certificates. Each certificate ensures the holder has the experience necessary to properly collect and preserve evidence at a scene and present that evidence in a court of law.

Heidi Hard is a communications specialist for the Texas Engineering Extension Service.

TAMUG Ocean and Coastal Studies Building

On Nov. 11, 2010, Texas A&M University at Galveston dedicated its largest construction project ever, the Ocean and Coastal Studies Building. The 104,000-square-foot facility houses state-of-the-art classrooms, labs and offices, plus a lecture theater and a unique Sea Life Center. The Center will enable researchers to bring in marine life directly from the Gulf of Mexico for immediate testing and analysis.

The new science building will bring together many of the region’s top marine biologists and marine scientists under one roof says Brad McGonagle, assistant vice president of administration. “It will be the centerpiece of our main campus and I know visitors will be very impressed,” he says. “I don’t think you can find a better marine science facility in this part of the country.”

Hands-on training  Texas Forensic Science Academy students (from left) Leslie McCauley, Brian Johns and Celestina Ross delicately excavate buried skeletal remains as they hover over a field evidence lab.
Shark Research

Continued from Page 1

“Sharks are an integral part of our ecological system because they are apex predators that keep everything below them in balance,” says Stunz.

For example, when there are not enough sharks to keep the stingray population in check, these cousins of the shark play havoc on the shellfish population, threatening the economic stability of the shellfish industry in many areas.

“Because they are at the top of the food chain, nature didn’t need them to reproduce early in life nor in large numbers. So the female gives birth to between two and eight pups, which are very slow to become reproductively mature,” Stunz says. “Unfortunately, nature didn’t figure man’s efficiency at removing fish from the ocean into the equation.”

Some species, like the bull shark, are not on the decline, but are tagged to study their migration patterns. The methods for tagging the sharks vary greatly from passive tags that offer anglers a reward for contacting the Institute if they catch a tagged shark, to acoustic tags implanted in the abdomen. The latest tracking tool is a pop-up archival tag that operates through the Argos Satellite Network. The tag sends information on the shark’s location, depth and the water temperature for up to one year after the shark’s release. However, each tag costs $5,000, which limits the number of sharks that can be monitored by this method.

Stunz also is studying methods for improving red snapper populations and using acoustic telemetry to determine the migration patterns of spotted sea trout, both of which are important to the sports-fishing industry that pumps almost $2 billion into the Texas coastal economy each year. The information gathered from these studies is supplied to state and national agencies that make regulations to ensure sustainable fisheries for a wide range of natural resources, including those in the Gulf of Mexico.

“Sometimes fish are removed so rapidly that they aren’t allowed to be replenished,” Stunz says. “We want to prevent that from happening. The loss of apex predators and other fish can have cascading impacts throughout our marine ecosystem. Everything is linked. You can’t remove one piece of the ecosystem because you often see unintended consequences.”

Renevable Energy

Continued from Page 1

For example, Texas A&M University’s Agricultural and Food Policy Center’s models for analyzing the costs of production for algae farms show that using current technology in algae farming is not profitable.

“However, with technology being developed by the AgriLife algae researchers and the NAAAB research team the total cost of production for algae oil will likely be in the range of $3.70 to $4.75 per gallon,” says Dr. James Richardson, AgriLife Research economist and co-director of the Agricultural and Food Policy Center. “A key factor in reducing the cost of algae oil to an affordable level will be the byproducts – lipid extracted algae and high valued oils. The value of animal feeds and human food supplements will reduce the cost of algae oil to the range of $1.60 to $2.30 per gallon. With this range of costs we could expect to see biodiesel costs in the range of $2.20 to $2.90 per gallon.”

The agency’s algae work began over three years ago, receiving more than $4 million from the Texas Emerging Technology Fund. That has evolved into a collaboration with the National Alliance for Advanced Biofuels and Bioproducts led by the Donald Danforth Plant Science Center.

“This is a very exciting aspect of our research and it could lead to other developments, particularly with work done at Texas A&M at Galveston,” says Shay Simpson, associate program director.

There, Dr. Antonietta Quigg is collecting and isolating algal strains, optimizing them for growth. Her work is to research the best strains of algae that could be incorporated into a marine production scenario. In Lubbock, Dr. Mark Burrow leads a similar effort at the AgriLife Research center. The algal strains his team is developing fit in an arid production scenario.

Meanwhile, at the AgriLife Research station at Pecos, the heart of algae production for the research lies in “raceways.” The pilot-scale ponds encompass about 1/16th of an acre. Paddle wheels stir more than 6,000 gallons of algae.

The Pecos station is best suited for algae production research, Simpson says. “Pecos has extreme temperatures and brackish water,” she says. “Algae thrives on brackish water. Lou Brown and Julia Brown (research assistant on the Pecos AgriLife Research station) are looking at the Pecos ground waters and how recycling the water would affect concentrations of nutrients in the algae and consequently the co-products.”

“If we can crack the code or find the right species or growth conditions, the production systems would take off,” Simpson says. She adds that the whole algae project wouldn’t be feasible without the potential for the development of many co-products. “We have six different objectives we are working on with over 30 researchers involved,” Simpson says. “Those are biology, cultivation, harvesting, conversion, co-products, and sustainability.”

The most cumbersome part of algae production is monitoring the ponds, Simpson says. That’s where one aspect of the research program is looking into engineering a monitoring device led by Dr. Alex Thomasson. His optical electronic-sensor automatically measures algae growth rather than samples having to be collected and taken to a laboratory for processing.

The optical sensor can monitor several strains of algae once calibrated and can be a timely measurement, particularly during times of volatile commodity prices, Simpson says.

“When gasoline prices are rising very sharply or during times of high feed costs, Alex can use this technology on the best selected five or 15 species of algae in developing instrumentation,” Simpson says. “We can find out lipid content, nutrients and other variables in a rapid manner.”

Meanwhile, back at the College Station laboratory, Wickersham speaks with optimism on his aspect of the project. He says researchers also hope to find a method to use the algae co-product as a source of nitrogen to be applied on rangeland, led by Dr. Jamie Foster at the Beeville AgriLife Research station.

“There’s still a lot of work to be done, but there’s a lot of potential here that could benefit agriculture,” Wickersham says.

Editor’s note: AgriLife Research acknowledges funding of the algae work by the U.S. Department of Energy under contract DE-EE0003946 awarded to the National Alliance for Advanced Biofuels and Bioproducts.

Blair Fannin is editor, media relations for Texas A&M AgriLife Communications.

For more information about the agency’s algae research program, visit: http://agrilife.org/algaeforfuel/
Texas A&M researcher inspires high school students

By Tim Schnettler

As Texas A&M University chemical engineering professor Dr. Mark Holtzapple was making a presentation during the 2009 teacher’s summit, one hand in the back of the room kept shooting up. The hand belonged to Nghia Le, an engineering teacher at Booker T. Washington High School/High School for Engineering Professions.

Le was fascinated with Holtzapple’s presentation on the star rotor engine and wondered if there was a way the project could be attempted by students in his alternative energy program.

“Out of the 200 teachers that were in the audience, he was the one that showed a lot of interest and enthusiasm,” Holtzapple says. “He shoots for the moon. One of his goals is to have a student rocket actually orbit the earth. That shows the heights that he is willing to dream.”

Although appreciative of Le’s enthusiasm for the star rotor engine, Holtzapple was quick to temper it, pointing out that it probably was not the best for the MixAlco project, which converts municipal solid waste, sewage, forest products, and non-edible energy crops into chemicals and alcohols that be turned into gasoline and fuel.

That meeting almost two years ago has developed into a mentorship between Holtzapple, Le and the students in the alternative energy program.

“He is a great mentor for me and for my students,” Le says. “For my students, I could not find a better mentor. We call him and he has time to answer questions for my students. A lot of times university professors are not very readily accessible, but he is.”

The students recently revealed to Holtzapple, and to more than 50 people in attendance for their presentation, that they successfully made gasoline from waste taken from their high school cafeteria. It was an achievement not lost on Holtzapple.

“Actually, it makes a tear come to my eye,” he says. “To take waste materials and turn it into gasoline has been my career objective. And now to see high school students doing that is fantastic.”

The amount of gasoline the students made was minimal, but that did not temper the enthusiasm of those involved with the project. “If high school students can turn waste material into gasoline, why can’t adults do it?” Holtzapple says.

WASTE-FUEL Students from Booker T. Washington High School and the High School for Engineering Professions in Houston who are converting cafeteria waste into fuels using the “MixAlco” technology pose with Holtzapple (second from right) and Le (far right) in front of a washing machine they converted into a centrifuge.

New Regents Appointed

Three new regents have been appointed to The Texas A&M University System Board of Regents. Judy Morgan of Texas A&M-Commerce, Cliff Thomas of Victoria and Elizabeth Mendoza of San Antonio were appointed to the Board of Regents in February by Gov. Rick Perry. Their terms expire Feb. 1, 2017.

Richard A. Box was elected chairman of the board at the March Board of Regents meeting. Phil Adams was elected vice chairman.

Morgan is owner and president of Jack B. Kelley Enterprises Inc. She also is president of the Women for Texas A&M University-Texarkana Board and a member of the U.S. Compressed Gas Association. She received her bachelor’s degree from the University of Houston and her Master of Business Administration from A&M-Texarkana.

Thomas is owner and CEO of Thomas Petroleum LLC, C.L. Thomas Inc. and Speedy Step Food Stores. The Corpus Christi businesswoman is a member of the Texas Petroleum Marketers and Convenience Store Association and the National Association of Convenience Stores. He received his bachelor’s degree from Texas A&M University.

Mendoza is founder, president and CEO of Conceptual MindWorks Inc. She is a member of the P16Plus Council of Greater Bexar County, board member of Generation Texas San Antonio and member and past vice chair of the San Antonio Greater Chamber of Commerce. She received her bachelor’s degree from Texas A&M.


Fernando Trevino Jr. of Brownsville has been appointed new student regent. Trevino is currently working toward a bachelor’s degree in political science at Texas A&M and a master’s degree in public service and administration from the George Bush School of Government and Public Service.

Young Inspiration

Marcie Tiraphatna appears to be a typical 10-year-old girl. She likes to play the piano and read. She enjoys school and dreams of becoming a math professor. But Marcie is not surrounded by fifth graders as she studies her favorite subject; she is surrounded by students at Texas A&M University-Texarkana.

Marcie enrolled in fall 2010 as the youngest student at A&M-Texarkana and began working on her undergraduate degree in mathematics. She plans to pursue a master’s degree and possibly a doctoral degree after graduation. Marcie says she is mindful of the effect her age has on fellow students – she notices the importance of education and taught all of them the importance of obedience in learning. Prior to enrolling at A&M-Texarkana, Marcie attended Southern Arkansas University and Cossatot Community College, where her 15-year-old sister Chendara earned an associate degree. When she is not in class, Marcie spends time helping out at her father’s convenience store.

Bob Bruggeman is communications manager at Texas A&M University-Texarkana.

For a video from the event, visit: www.youtube.com/watch?v=0mcc-R-eUu8

Texas A&M Press Top 5 Books

Rudder: From Leader to Legend

By Thomas M. Hatfield

In this first full-length biography of James Earl Rudder, Hatfield details the life of Rudder; starting from his childhood; uncovering his study military exploits, and finally revealing his remarkable personal achievements and far-reaching public service, including his years at the helm of Texas A&M.

“For the first time I am sharing my experience as a leader. I hope readers will find inspiration from this true story of how I rose to the helm of Texas A&M,” Rudder says. “I hope I can encourage more people to pursue their dreams and to reach their goals.”

Rudder: From Leader to Legend profiles Rudder’s early life, his family, his significant military achievements and his many years of public service.

Heirloom Gardening in the South: Yesterday’s Plants for Today’s Gardens

By William C. Welch and Greg Grant with Cynthia Mueller and Jason Powell (Foreword by Felder Rushing)

Welch and Grant provide a comprehensive book for anyone who wants to know how to find and grow time-honored and pass-along plants or who wants to create and nurture a traditional garden.

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The Texas Tomato Lover’s Handbook

By William D. Adams

(Photographs by William D. Adams and Deborah J. Adams)

Adams draws on more than 30 years’ experience to provide a complete, step-by-step guide to success in the tomato patch.

Alexandre Hogue: An American Visionary—Paintings and Works on Paper

By Susan Kallil

In this book featuring the full breadth of the artist’s works in stunning color, Houston-based curator and critic Susie Kallil reveals Alexandre Hogue as he presented himself and his work to her.

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Astronaut Richard Linnehan a Key Leader for Texas A&M System's New Initiatives in Space Science, Policy and Education

Astronaut Rick Linnehan’s multiple space missions have given him a global perspective. He understands the value of space exploration and that further advances are possible only through multinational cooperation and education.

His passion and perspective will lead The Texas A&M University System’s Space Science, Policy and Education program in an assignment through a partnership with NASA designed to reinvigorate and pioneer research critical to space discovery and exploration. The temporary directorship furthers the A&M System’s mission to develop and implement space science initiatives in policy, technology and education.

“I am honored to be part of the A&M System team and look forward to establishing and contributing to broad-based initiatives in science education, biomedical research and technology development which will benefit the citizens of Texas and our national space program,” Linnehan says.

Linnehan is a veteran of four space flights aboard shuttles Columbia and Endeavour, and has spent a total of 58 days in space and 42 EVA (spacewalk) hours. That experience and Linnehan’s veterinary background provide unique educational and policy perspectives that will aid in the development and implementation of primary, secondary and university-level space science curricula, including the creation of a space policy section at Texas A&M University’s George Bush School of Government and Public Service. Linnehan also will work with researchers throughout the A&M System to advance aerospace engineering, physics, space performance, flight, and biological countermeasures.

Rebecca Watts is a communications specialist for The Texas A&M University System Office of Communications.

‘Miracles Still Happen,’ Says Aggie Who Led Chilean Mine Rescue

When I first heard that the rescue of the 33 trapped Chilean miners would take four months, I kept thinking how I’d feel if my son or brother were down there. I thought there must be some way to get to them faster.

While designing my plan, I learned that Center Rock Inc. in Pennsylvania was trying to sell its cluster hammer to the Chilean government to drill a large escape shaft, but no one would listen to them. I asked Center Rock to send me technical information on the hammer, and after studying its design I knew it was the final piece of the puzzle needed to perfect my plan.

My company has a solid, 25-year relationship with the Chilean mine ministers, so they were readily available to discuss our plan. Although 80 percent of the experts laughed, the 20 percent who believed in us were the ones who really mattered. The Chilean government did accept our proposal, naming it Plan B. (The prolonged Plan A, an elevator shaft, was being drilled simultaneously.)

Plan B was a joint effort involving many companies, technical experts and advanced drilling equipment. One company even flew in its best driller from Afghanistan. One of my companies, DSI American Manufacturing, coordinated the transport of drilling equipment to the job site. Through its humanitarian program, UPS flew the cluster hammer and related gear from Pennsylvania to Santiago, where it was met by the Chilean Air Force and flown the remaining 500 miles directly to the site.

The cluster hammer creates much less vibration than the large 600-pound piston-type air hammer typically used to drill large bore holes. Still, the possibility of another rock slide led to many sleepless nights. I wasn’t too worried about the miners fitting into the rescue capsule. I’m a big guy, about 6-7, and I knew that somehow I’d get myself into it if I were down there. I turned out to be wrong about our proposed timetable of six weeks. By working 24/7, we managed to reach the 33 miners in 33 days. I was on-site for the final eight days and 250 meters (more than 800 feet) of drilling. When the last miner was out, I tried to fight off tears because I knew everybody would rib me mercilessly on future drill sites. But eventually I lost that battle and cried out of thankfulness and relief that those 33 men were finally reunited with their families.

Reprinted from Spirit magazine, Texas A&M Foundation.

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Helping Hand

Texas A&M University former student Greg E. Hall ’82 gives a hopeful gig ’em at the site of the Chilean mine collapse. Hall is one of the designers of “Plan B” that aided in rescuing 33 miners who had been trapped for over a month.