


AgriLIFE RESEARCH

Texas A&M System

Blackland Research & Extension Center



Texas AgriLife Research, Blackland Research and Extension Center (BREC), a part of the *Texas A&M System*, is improving the lives of people in Central Texas and throughout the world. Scientists at the center are improving the region's land and water and soil resources by conducting research and developing new technologies to address agriculture, the military and urban issues facing central Texas and beyond. Here are few other facts about Blackland.

MISSION

To be a preeminent land and water research and outreach center in Texas. To achieve this, we will:

- Be forward thinking and responsive to the needs of citizens and stakeholders.
- Develop science-based solutions to meet our challenges in land, water, climate, and energy.
- Work synergistically with other parts of the Texas A&M System; local, state and federal government agencies; international agencies; and private enterprise.
- Support the personal and professional development of our employees.
- Promote understanding and opportunities in science to students and the community.

BACKGROUND

Created in 1909, BREC is part of the Texas AgriLife Research (formerly Texas Agricultural Experiment Station), a state agricultural research agency affiliated with the Texas A&M System (TAMS). One of 13 off-campus research and extension centers that, along with Texas A&M University (TAMU) faculty, performs research and delivers education programs for the citizens of Texas to ensure a safe and affordable food supply; saves and restores the environment; and strengthens the economy. BREC shares research facilities with the Grassland, Soil and Water Research Laboratory (GSWRL) of the USDA/Agricultural Research Service (ARS). Texas AgriLife Research and ARS scientists have worked cooperatively at Temple for over 80 years. In addition, BREC research programs involving scientists from the Natural Resources Conservation Service (NRCS) and the US Environmental Protection Agency (EPA), who are co-located at the lab, also exist. The synergism between Blackland and Grassland scientists is a principal reason for the success of the Temple laboratory. Research programs from both agencies are closely linked and scientists are able to capitalize on the strengths of one another. Resources (e.g. equipment, personnel, financial) are shared and joint research is planned and conducted.

RESEARCH PROGRAMS

Research and extension programs at Blackland are led by a distinguished group of scientists who are assisted by a dedicated support staff. Current research areas emphasize:

Agro-Ecosystem Analysis and Modeling

Dr. Jay Angerer (Ph.D., Texas A&M University) develops and applies models and decision support systems to improve management, productivity and sustainability of pasture and grazinglands in the USA and developing countries.

Dr. William E. "Bill" Fox, III (Ph.D., Texas A&M University) conducts research on restoring disturbed agricultural and natural ecosystems. Identifies best management practices to ameliorate impairments or mitigate unintended consequences of agriculture,

Dr. Tom Gerik (Ph.D., University of Nebraska) who also serves as the Resident Director for the Blackland Research and Extension Center, performs research using on-farm field studies and simulation models to identify best management practices that alleviate constraints to production and profitability of field crops and minimize impacts of cropping systems on water quality and the environment.

Dr. Armen Kemanian (Ph.D., Washington State University) develops and applies computer decision support systems to improve agricultural systems, to improve production efficiency, and to alleviate the adverse impacts of farm management on soil, water, and air quality.

Dr. Javier Marcos (Ph.D., Washington State University) evaluates, develops and manages agricultural systems through the use of environmental data (GIS) and simulation models for the assessment of sustainable agricultural systems.

Dr. Manyowa Meki (Ph.D., University of Cambridge, UK) uses biophysical models to evaluate best management practices and assess environmental impacts of potential grain, biomass and oilseeds cropping systems.

Hydrologic Systems Modeling

Dr. Santhi Chinnasamy (Ph.D., Anna University, Madras, India) conducts hydrologic and environmental research to assess the impacts of agricultural and natural resource systems.

Dr. Narayanan Kannan (Ph.D., Cranfield University, UK) models flow and transport of pollutants to rivers and simulates the impacts of various management practices on water quality and quantity.

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Dr. Jaehak Jeong (Ph.D., University of Texas) conducts hydrologic and environmental research to assess the impacts of natural resource systems within urban communities.

Dr. Pushpa Tuppada (Ph.D., Kansas State University) applies biophysical models to develop watershed protection strategies. Simulates the impacts of various agricultural management practices on streamflow and water quality, at field and watershed scales.

Dr. Xiuying (Susan) Wang (Ph.D., Purdue University) conducts hydrologic and environmental research to assess the impacts of agricultural and natural resource systems. Develops and tests and improves agriculture and natural resource simulation models.

Dr. Jimmy Williams (Ph.D., Texas A&M University) develops and applies models to evaluate impacts of management practices on watersheds and impacts of on-farm management decisions on environmental quality.

Spatial Science and Integrated Information Systems

Dr. Mauro DiLuzio (Ph.D., Padua University, Italy) develops GIS and modeling technology, applications, and database products to address agricultural, urban, and natural resource problems across-scales, from multi-sources, and using eco-spatial conceptual methods.

Dr. Paul Dyke (Ph.D., Oregon State University) serves as the focal point for many of the national and international integrated applications of models and databases and is applying techniques to automate soil delineation.

Dr. Raghavan Srinivasan (Ph.D., Purdue University), who also serves as the Director of the Spatial Sciences Laboratory at TAMU, develops Internet-based tools using GIS and remotely sensed data, and integrates data into spatial information systems. Manages training and educational outreach for use of GIS and application of natural resource and hydrologic models for water quality and land use change.

Water Science - Quality and Monitoring

Dr. Dennis Hoffman (Ph.D., University of Nebraska) performs field research and provide technical assistance to improve water quality from agricultural, military, and urban land use and ecosystems.

Dr. Rajani Srinivasan (Ph.D., Chattrapati Shahu Ji Maharaj University, Kanpur, India) performs research on methods in soil and water chemistry, specializing in the identification of contaminants that adversely impact the water quality.

HIGHLIGHTED ACTIVITIES

Conservation Effects Assessment Program (CEAP). Texas AgriLife Research, ARS, and NRCS scientists at Temple are cooperating on a large national project (CEAP), whose objective is to quantify the environmental benefits (e.g. improved water and air quality) of USDA conservation programs (e.g. Environmental Quality Incentives Program and Conservation Reserve Program). Analytical tasks involve the development and use of weather, soils, crop management databases, and the simulation models developed by Temple scientists.

Healthy Rivers and Streams. The water quality team seeks to alleviate water quality impairment, stream bank erosion and downstream flooding caused by rapidly expanding rural, urban, and industrial growth in Central Texas. Efforts to bring science-based analysis of streams (such as Cowhouse, Nolan, Friars, Pepper, and Bird Creeks in Bell County) and watersheds (such as Leon, Lampasas, and Bosque) are underway along with community-based programs to foster public awareness and involvement promoting grass-root solutions for the complex problems characteristic of Central Texas streams.

Fort Hood Revegetation and Training Land Restoration Projects. In cooperation with the Fort Hood-Integrated Training Area Management and Texas Water Resources Institute, Blackland scientists are performing field research, monitoring the installation and implementation of best management practices, and developing decision aids and operating procedures to restore and maintain Fort Hood training areas.

Agriculture and Natural Resource Risk Management. Blackland scientists are developing user-friendly software tools to assist growers and agricultural advisors in minimizing risks associated with agriculture and natural resource management and explore opportunities for conservation practices such as carbon sequestration. The tools incorporate biophysical models with GIS and Windows interfaces to evaluate the impacts of farm and field management on productivity, profitability and the on-site and off-site effects on soil and water resources.

Rangeland Drought Monitoring and Management. Blackland scientists, in collaboration with the TAMU Center for Natural Resource Information Technology, are developing methods for combining remote sensing, simulation modeling, and GIS to provide near real-time monitoring and early warning of drought in the US and in Mongolia, East Africa, and Afghanistan. Tools are also being developed to support information delivery allowing rangeland managers to reduce risk, improve marketing options, and make timely livestock decisions in the face of drought and other disasters.

CO-LOCATED AGENCIES

USDA-ARS, Grassland Soil and Water Research Laboratory (GSWRL) – Eleven scientists with the Natural Resources Research Unit work collaboratively with AgriLife Research. GSWRL research focuses on developing plant growth and natural resource, and hydrologic models to ascertain the impact of management of crops, grazing, forest, and urban on soil and water resources. They also perform research to improve the ability to manage both crop and grazing lands in an economically and environmentally sustainable manner by resolving uncertainty concerning the effects of rising atmospheric CO₂ on ecosystem processes; developing effective biological control programs for controlling saltcedar in the river systems of the western USA; and improving the effectiveness of nitrogen fertilization of cropland. GSWRL has an operating budget of approximately \$3.5 million, a 25,000 ft² research facility, and conducts research on 550 acres of land in Temple and 840 acres of land near Riesel, TX. (Dr. Jeff Arnold, Agricultural Engineer and Director)

NRCS (National) – Two staff members from NRCS National Headquarters in Washington, D.C., are co-located at Temple. They work on natural resource and economic issues; evaluate soil erosion and resource conservation policies; and transfer technology and databases to NRCS. (NRCS personnel: Dr. Jay Atwood, Agricultural Economist, and Dr. Lee Norfleet, Soil Scientist)

NRCS (Texas) – Since 1992, the Water Resources Assessment Team (WRAT) from NRCS state headquarters was co-located at the laboratory. This group, termed, interacts closely with ARS and AgriLife Research scientists to apply hydrologic simulation models, often in conjunction with GIS software and large databases, to solve water resource problems in Texas, and to provide researchers with feedback on model performance. (NRCS personnel: Mr. Tim Dybala, Civil Engineer, Mr. Carl Amonett, Soil Conservationist, and Mr. Todd Marek, Civil Engineer)

Environmental Protection Agency (EPA, Region 6) – One staff member from the Dallas office of the EPA, Marine & Wetlands Section, is co-located at BREC. He cooperates with Texas AgriLife Research and ARS researchers on water quality issues, especially riparian restoration. (EPA Personnel: Mr. Jim Herrington, Region 6, EPA)

Texas AgriLife Extension – Four Texas AgriLife Extension employees are co-located at the laboratory. They focus on family and 4H at Fort Hood and other military installations statewide. (Personnel: Ms. Marilyn Prause, Extension Programs Specialist).

RESOURCES

Computer – There are over 150 personal computers, Windows-based servers and UNIX-based workstations serving both local and web network services, and other computer hardware components (hard drives, large format printers, scanners, etc.) connected in a high-speed (100 Mb/s) local area network. Blackland has excellent high-speed connections to the Internet through TAMUS. A staff team maintains the network.

Facilities – A 12,000 square foot office building serves as the main Texas AgriLife Research headquarters. Blackland staff also occupies space within the facilities of the GSWRL and has access to offices, laboratories, greenhouses, shop facilities, and land for field experiments.

Financial – From FY2003 through FY2007, the BREC budget averaged about \$3 million per year. Approximately \$2 million of this total budget was obtained from grants and contracts and the remaining \$1 million was obtained from Texas AgriLife Research.

Human – There are about 90 full-time employees at the laboratory in Temple. Of these, about 45 are with Texas AgriLife Research, 40 are with ARS, and 5 are with the NRCS. In addition, Blackland scientists support graduate students at TAMU and other universities. Visiting scientists from other universities and countries are often present.

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