

**ENVIRONMENTAL AND NATURAL RESOURCES
RESEARCH AND EDUCATION
AT NEW MEXICO STATE UNIVERSITY**

**Faculty and Staff Expertise
Centers/Institutes/Laboratories
Facilities and Equipment
Consortium and Team Efforts**

**Prepared by the New Mexico Water Resources Research Institute
on behalf of the
Environment and Natural Resources Forum
New Mexico State University
Las Cruces, New Mexico 88003**

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INTRODUCTION

In the fall of 1991, Dr. Averett Tombes, Vice President for Research and Economic Development at New Mexico State University, established an Environment and Natural Resources Forum whose goal is to enhance the overall competitiveness of the university in obtaining funding for research and educational activities in various disciplines associated with environmental and natural resources issues. The ultimate purpose is to find solutions to present and future environmental and natural resources problems.

The Forum, consisting of 22 faculty and staff knowledgeable of research and educational programs at NMSU, conducted a university-wide capability assessment of NMSU abilities to address selected environmental and natural resources issues. The information obtained was entered into a database and used to produce this document.

For our purposes, we have defined environmental and natural resources in a broad context and encouraged everyone with an interest in this area to participate. The first assessment was conducted in the spring of 1992 and an update was completed in the fall of 1993. This document attempts to be as up-to-date as possible given the ever changing faculty and staff and their research and educational interests.

The Database

The information in this publication also is available on a computerized database at the New Mexico Water Resources Research Institute. The database is kept as current as possible, with new participants and updates to currently participating faculty added each month. Faculty and staff interested in reviewing the database can obtain a copy on diskette from the WRRRI (646-1195). Eventually we hope to make the database accessible via NMSUnet. Those interested in having their names added to the database and directory, or interested in making changes to their entries should also contact the WRRRI. Published updates will be issued as appropriate.

Guide to Using this Document

The first part of this document provides basic information on the 45 centers, institutes and units involved in some capacity in the environment and natural resources. Each unit is described briefly with a contact person and telephone number given.

The second part of the document is an alphabetical listing of 129 faculty and staff profiles containing information on the person's research and educational interests; relevant publications since about 1990; pending or funded research projects including project title, sponsoring agency, award amount, and project duration; foreign experience including international efforts and foreign languages spoken; relevant team efforts in which the person is involved whether on-campus or off; and any special facilities and holdings such as laboratory equipment, rare references and holdings, datasets, computers, software, maps and the like.

Faculty profiles are followed by a keyword index developed from the interests listed in each profile.

**NMSU UNITS INVOLVED
IN ENVIRONMENTAL AND
NATURAL RESOURCES
RESEARCH AND
EDUCATION**

Agricultural Experiment Station

Gary Cunningham
646-3125

The Agricultural Experiment Station is the research division of the College of Agriculture and Home Economics. Professional personnel and graduate students working in the station conduct basic and applied research concerned with biological, physical, and economic phases of food and fiber production, processing, and distribution; consumer health and nutrition; and the social and economic aspects of rural living. Energy, environmental, and natural resource conservation aspects of these broad disciplines offer many opportunities for the graduate student to undertake meaningful research investigations in both the laboratory and the field.

There are seven departments on the main campus with excellent laboratory facilities for research. In addition, the station maintains fourteen off-campus field research locations that include six off-campus science centers, a tree research center, a cattle research center, an animal insect lab, and three ranches.

The station provides financial support to graduate research assistants and cooperates with several research institutes at the university and with various state and federal agencies in providing opportunities for graduate research programs covering a wide scope of student interest.

Analytical Geochemistry Research Laboratory

Nancy McMillan
646-5000

The Analytical Geochemistry Research Laboratory is dedicated to faculty and student research projects, and is also available for private and federal research and industrial applications. Instrumentation for chemical and mineralogical analysis and sample preparation facilities are located in the Geological Sciences Department of New Mexico State University. Laboratory personnel and the Geological Sciences Department have analytical and interpretive expertise in the areas of geochemistry, mineralogy and petrology.

The principal instruments in the laboratory include:

- ▶ a Perkin Elmer ICP/6000 Inductively Coupled Plasma Atomic Emission Spectrometer (ICP), an elemental analysis apparatus which, via a plasma atomization source (~8000 K), can examine an unusually wide range of concentrations and is virtually free of chemical and ionic interferences; and
- ▶ Rigaku D-Max IIA X-RAY Diffractometer (XRD), an instrument well suited for the identification of fine-grained minerals in powder form, and material crystal structure studies.

Current "standard analysis" procedures include complete major element (SiO₂, TiO₂, Al₂O₃, Fe₂O₃, MnO, MgO, CaO, Na₂O, K₂O, P₂O₅) ICP analyses of silicate and carbonate rocks (including volatile content as total volatiles, or H₂O+ and H₂O-) Sr, Ba, La, Y, Zr, Sc, Zn, Cr, V trace element concentrations by ICP in silicate and carbonate rocks, metal contents of various solutions by ICP, and XRD mineralogical analyses of rocks and soils. Research petrographic microscopes with photomicrography and point counting capabilities are available in the Department of Geological Sciences.

The laboratory is developing procedures/apparatus for rare earth element analyses and Fe₃⁺/Fe₂⁺ ratios in silicate rocks. Future plans include the acquisition of a graphite furnace atomic absorption spectrometer in order to enhance detection of alkali metals and certain transition elements.

AGRL instrumentation and specifics include:

Perkin Elmer ICP/6000 Inductively Coupled Plasma Atomic Emission Spectrometer
Argon plasma powered by radio frequency generator

- ▶ Sample introduction by peristaltic pump and cross-flow Argon nebulization
- ▶ Sequential monochromator (Model 5000)
- ▶ Digitally controlled holographic gratings accommodate wavelengths from 185 to 900 nm minimum (used in 1st order)
- ▶ Argon purged optics
- ▶ Detector: multi-alkali cathode photomultiplier tube
- ▶ Microprocessor control

- ▶ Resolution: 0.028 nm (FWHM)
- Computer (model 7500) and Printer (PR 210)
- ▶ Electronics module with 16-bit Motorola 68000 microprocessor, 640+ K RAM
 - ▶ Disc module with 10 Megabyte hard disk and 2 double sided, double density floppy disc drives
 - ▶ Display module with 13 inch color monitor and soft keys
 - ▶ Keyboard combination of standard keys and 32 special function keys
 - ▶ Color print capability
- Rigaku X-Ray Diffractometer System Geigerflex D/Max-IIA
- ▶ X-Ray generator
 - ▶ 2 kW
 - ▶ X-Ray tube
 - ▶ 1.6 kW
 - ▶ CuK-alpha radiation, wavelength = 0.1541178 nm
 - ▶ Water cooling from Haskris heat exchanger
 - ▶ Tube shield and shutter
- Goniometer
- Detector
- ▶ Curved graphite crystal (0002) ($r=112$ mm) and NaI scintillation (with photo-multiplier) counter
- Radiation enclosure with safety interlocks
- Recorder (Strip chart, intensity vs. 2 theta)
- Microcomputer (goniometer control) and discharge printer
- Sample preparation for ICP and XRD
- ▶ Wet chemical laboratory
 - ▶ 12" by 3/4" steel plate and retainer for crushing samples
 - ▶ 100 ml capacity tungsten carbide ring and puck shatterbox
 - ▶ 100 ml capacity sintered corundum ring and puck shatterbox
 - ▶ Sartorius 2842 4 place analytical balance
 - ▶ Desiccator
 - ▶ Thermolyne 1400 muffle furnace (up to 1100 degrees C)
 - ▶ Agate and porcelain mortar and pestles
 - ▶ Bath type ultrasonic generator (accessible)
 - ▶ Beckman Instruments L2-65B centrifuge

Apache Point Observatory

Kurt S.J. Anderson
646-1032

Apache Point Observatory is located in the Sacramento Mountains of south-central New Mexico. Its principal instrument is a fully equipped optical-infrared astronomical telescope with a 3.5 meter diameter primary mirror. This facility is operated by the Astrophysical Research Consortium (ARC) which consists of New Mexico State University, the University of Washington, Princeton University, the University of Chicago, Washington State University, Johns Hopkins University, and the Institute for Advanced Study. New Mexico State University manages the observatory for the Consortium. The 3.5 meter telescope is of advanced design and optimized for remotely controlled observations. It is used by astronomy faculty and graduate students for conducting research in diverse areas of astronomy and astrophysics.

Construction for a second major telescope, the Sloan Digital Sky Survey telescope, began in 1993. This 2.5 meter instrument will address several outstanding questions of cosmology. Its principal goal will be to produce a three-dimensional map of our universe extending to great distances. New Mexico State University is also constructing a 1 meter telescope, remotely controlled and optimized for wide-field imaging, at Apache Point Observatory. This telescope will be fully operational in 1994 and will be used by NMSU for graduate instruction and for faculty and graduate research.

Arts and Sciences Research Center

Carol L. Walker
646-2611

The Arts and Sciences Research Center is the coordinating office for all research related activities within the college. The primary functions are those of service to departments and faculty members, and grant administration. The center encourages and stimulates individual research efforts and facilitates the development of potential research programs within the college, with other colleges, various institutes, and the Physical Science Laboratory. Operationally, its major functions are to assist faculty members in the college prepare proposals and reports and to provide various services and financial support to faculty members pursuing research and scholarly activities. Typically, support services fall within, but are not limited to, the following areas:

- ▶ computerized funding source locator
- ▶ contact with granting agencies
- ▶ proposal preparation, including budgets
- ▶ administration of grants and contracts
- ▶ bookkeeping on grants and contracts
- ▶ Word Processing Center - secretarial services
- ▶ liaison with NMSU's Office of Grants and Contracts

The center provides support in the glassblowing, electronics, and machinery areas and administers the Electron Microscope Laboratory.

Biosafety Laboratories

Charlotte McCarthy
646-3926

NMSU's Biology Department contains two biosafety level II laboratories. The labs have:

- ▶ 2 biosafety II hoods
 - ▶ several incubators and incubator shakers
 - ▶ refrigerated centrifuge
 - ▶ photomicroscope
 - ▶ HPLC system
-

Border Research Institute

Maria Telles-McGeagh
646-3524

The Border Research Institute at New Mexico State University plays an integral role in developing programs that promote cooperation between the agricultural, business, and academic sectors to increase mutual awareness of opportunities for international trade and cultural exchange. The institute serves as a clearinghouse of information for local, state, and federal policymakers as well as for the general public. The institute also publishes various materials related to the US-Mexico border.

The institute's mission is to facilitate, advise, coordinate, disseminate, and educate in issues regarding the U.S.-Mexico border region. The effectiveness of the institute is a direct result of its autonomy within the university structure, the ability to network, and the capability to coordinate efforts. The institute's multifaceted functions include conducting conferences and workshops, developing curriculum, fostering faculty growth, and maintaining library and computer database resources.

Bureau of Business Research and Services

Kathy Brook
646-1434

Founded in 1969, the bureau is the administrative unit for research in the College of Business Administration and Economics. It provides business and economic research services to the public and private sectors. In addition it provides management training to business organizations, government agencies and the general public. Areas of expertise include economic and demographic analysis and forecasting, public utility regulation, transportation and logistics, team learning, environmental research and policy, and local and regional economic development.

The Bureau of Business Research and Services is a member of the Association for University Business and Economic Research.

Center for Anthropological Research

Neal Ackerly
646-2520

The Center for Anthropological Research supports cultural resource studies focusing on the archaeology and history of south-central New Mexico. While past research has been funded by external contracts, more recent activities have relied on both contracts and grants. Research has included such diverse activities as:

- ▶ multi-part archaeological studies of playas in the Jornada del Muerto,
- ▶ studies of contemporary irrigation systems in the Mesilla and El Paso Valley,
- ▶ historic architectural analyses of National Register Historic Districts and recently-acquired Bureau of Land Management holdings at Cox Ranch,
- ▶ inauguration of long-term oral histories among Hispanic farmers throughout the region, and
- ▶ in-depth overviews of Spanish Colonial history-based detailed translations/transcriptions of microfilm archives that have been collected by center staff.

Additional cooperation between NMSU, the center and other institutions has been facilitated by a series of Memoranda of Understanding between the center and agencies such as the US Department of Agriculture Jornada Experimental Range, Elephant Butte Irrigation District, and the Laboratory of Tree-Ring Research at the University of Arizona.

The Department of Sociology and Anthropology maintains a 5,000-square-foot facility in the University Museum on the NMSU campus. The museum facilities contain offices, laboratories, a 4000-volume research library, a complete topographic map library of New Mexico, drafting facilities, and storage areas. Microfilm holdings include all New Mexico State Territorial Engineer documents, U.S. Census records (1900-1920), Territorial Censuses, Juarez Municipal archives, Spanish Land Grant records, and county tax rolls. Archival studies are facilitated by a Canon PC80 microfilm reader/printer. The center also has all Government Land Office township/range maps of the terrain from about 1852 to the 1920s; Soil Conservation Service maps of agricultural and irrigated areas; Bureau of Reclamation maps of various types dating from about 1907; and private plat maps for the southern part of New Mexico originally prepared by private surveyors for private individuals.

The center is currently involved in two planning projects focusing on the prehistoric archaeological resources of State of New Mexico lands in Doña Ana County, New Mexico. Both of these projects focused on playa margin adaptations and paleoenvironments in the Jornada del Muerto.

Also, the center is working on a study of archival records and maps showing the development of irrigation systems in the Lower Rio Grande Valley area south of El Paso. As part of this project, oral history interviews are being conducted with descendants of the original settlers of Socorro and San Elizario. These interviews, conducted in English and Spanish, have examined changes in agricultural practices, major historical events, among others, providing written documentation of life in these communities during the early 20th century.

Center for Educational Development

Frank Smith
646-2204

The primary mission of the Center for Educational Development is to provide a variety of educational services to faculty in all disciplines. The services are designed to aid faculty in the delivery of effective instruction in traditional and nontraditional settings.

The center provides program planning and evaluation for faculty and staff including multi-media presentations; audiovisual equipment; photographic services including studio work; graphic services, brochures and handouts, publication layouts, and original illustrations; and teleconferencing capabilities including a university cable TV system in over 80 classrooms, and two teleclassrooms.

The director and assistant director of the center have extensive experience in developing telecourses and traditional courses for all types of disciplines.

Center for Hospitality and Tourism Studies

Pat Moreo
646-5995

The Center for Hospitality and Tourism Studies provides a vital link between NMSU and New Mexico's \$2 billion hospitality and tourism industry. A variety of educational seminars, conferences, and work shops as well as one-on-one consulting are made available to the industry through the center. The center is a focal point for applied research and educational programming for the hospitality and tourism industry in New Mexico and the border states region.

The center's goals are as follows:

- ▶ coordinate talent within NMSU which may be called upon when there is a need for expertise related to hospitality and tourism research studies, and applied applications
- ▶ develop a hospitality and tourism research base to assist faculty and graduate students obtain research and technical assistance funds
- ▶ cooperate with public agencies conducting research and developing programs related to the industry such as: the New Mexico Departments of Economic Development and Tourism, Energy, Minerals and Natural Resources, Forestry Division, Parks and Recreation, U.S. Forest Service, U.S. National Park Service, U.S. Fish and Wildlife Service, resource and conservation districts, and the Bureaus of Indian Affairs, Land Management, and Reclamation
- ▶ provide technical assistance to non-profit organizations, such as visitor and convention bureaus, regional tourism organizations, hotel and motel associations, and restaurant and tourism associations
- ▶ work in conjunction with NMSU's Cooperative Extension Service, the Rural Economic Development Institute, Border Research Institute and related programs in conducting and developing public service programs
- ▶ establish guidelines and assist in the development of high-quality training for industry professionals in New Mexico and Mexico

Center for International Programs

Harold Matteson
646-3199

The Center for International Programs (CIP), established in 1970, has campus wide responsibility for coordinating and facilitating international activities at NMSU. The center is comprised of two major sections: Administrative Support and Technical Assistance, and International Student Services and International Education Programs. International activities are developed in cooperation with faculty and staff associated with the colleges, departments, centers, and institutes across the campus. Once a decision, by academic departments, is made to participate in international activities, center staff assist in the coordinating, planning, implementation and evaluation of such activities. The center is responsible for most international administrative roles, while the cognizant academic departments assume the technical roles. Specific international activities which the center is and has been involved in are: technical assistance programs funded by United States government agencies, foreign governments, and/or international funding agencies, short-term academic/nonacademic training programs and projects, and providing opportunities for individual faculty involvement.

Direct contacts with U.S. government agencies, foreign governments, and the private sector concerning international activities are handled through this office. There are professional staff in the center, appointed by NMSU and authorized by the U.S. Immigration and Naturalization Service, who serve as "designated officials" regarding INS regulations governing foreign students. The center also coordinates the university's participation in the Consortium for International Development (CID), an organization of 12 western universities concerned with assisting the orderly development, management and use of the limited resources of the world.

Staff members of CIP support student exchanges between NMSU and schools abroad, coordinate the Fulbright-Hays program, International Exchange Program and other study and work abroad programs for domestic students and staff, administer the university's Exchange Visitor Program under auspices of the U.S. Department of State, provide information on study, work, lecturing, and travel abroad, and coordinates the admission of foreign students.

The center provides a full range of services to international students, including orientation programs, immigration and financial advising, community outreach programming, and admission services.

In addition CIP is also responsible for the administration of an English program for Spanish-speaking graduate students.

Center for Latin American Studies

Jose Z. Garcia
646-2842

The Center for Latin American Studies (CLAS) was organized in 1979 by the College of Arts and Sciences and is located in the historic Nason House on the main campus. CLAS is a consortium partner with the University of New Mexico (UNM), and in 1993 was one of fourteen national resource centers funded by Title VI, which is funded by the U.S. Department of Education. The Center focuses on U.S. and Mexico border issues, and is rapidly becoming involved with environmental policy issues. CLAS currently seeks funds to create an inventory of monitoring systems for air, water, and hazardous waste in the Las Cruces, El Paso and Juarez region. The CLAS is actively engaged in supporting a M.A. program on environmental resource management and public policy at the Universidad Nacional de Asuncion (UNA), Paraguay. Staff members organized and participated in a symposium on environmental problems in Paraguay in June 1993.

Center for Space Telemetry and Telecommunications Systems

William P. Osborne
646-3012

The center was established by NASA to help fulfill its long-range goal of exploring our solar system. Staff and graduate students participate in research directed toward the study of telemetry systems and advanced communication systems for data transport and processing technology. NASA, Sandia National Laboratories, the Jet Propulsion Lab, and the Department of Defense are some of the contracting agencies funding research.

Affiliated laboratories and interdisciplinary facilities include the Computer-Aided Design and Simulation Laboratory, Physical Science Laboratory, Microwave Laboratory Facilities, and Electro-Optics Laboratory.

Computer-Aided Design and Simulation Laboratory

Steve Horan
646-5870

The laboratory is used for research in modeling and algorithm development in several different areas in electrical engineering. The lab contains a SUN 4/280, a SUN 3/50, 3 VAXstation 3100s, one VAXstation 2000, one VAXstation 3500, and a VAXserver 3800. All platforms are connected to the campus network and the Internet. The laboratory has specialized simulation software packages to model communications systems at the signal level and the network level which allow users to model data flow in many environments. The laboratory also has software to design telemetry system user interfaces.

Computing and Networking Technology Organization

David Rocks
646-3439

The Computer Center provides a wide variety of services to all departments in the university. Both academic and administrative computing are centralized in one organization supporting the students, faculty, and staff of NMSU with their computational data processing requirements in education, research, and administration.

NMSU-NET, the campus data network, links the academic buildings on campus. More than 100 shared host computers are available through the network, and more than 3,000 devices connect to these hosts. Access to the state data network, NM Technet, and to the six-state regional network, WESTNET, allows wide access to more than 20 institutions in the region and to hundreds of institutions in our connection to the nationally shared INTERNET. Supercomputing is available through a local CRAY YMP-EL and from national centers.

An IBM ES/9000 Model 440 provides mainframe computing. Several VAX systems and large SUN systems highlight the more than 100 network servers providing shared computational services to the community. Consultation on the thousands of application software

systems is provided on a 120-hour-a-week basis. Statistical advice from teaching statisticians is also provided.

More than 5,000 microcomputers and another 500 terminals exist on the campus, many located in more than 51 clusters maintained for general access. Special Macintosh and graphics clusters are customized for these purposes and are open to the general community.

Administrative computing has ON/LINE systems for all student activity. Data base management systems and query facilities give wide access to information and rapid processing of student transactions.

Students, faculty, and staff enjoy a number of special services in addition to the availability of a full spectrum of quality computing functions. These include:

- ▶ Short courses at no charge to build skills in the use of central services
- ▶ Short courses, for a fee, to faculty, staff, and students, covering specialized computing topics
- ▶ Maintenance of software and hardware for a number of popular personal computers
- ▶ A library of computing materials and references
- ▶ Network development and services to access other computer centers via national networks
- ▶ Student and staff consultants to help anyone with computer problems
- ▶ Support of several clusters of terminals and microprocessors besides the large central cluster
- ▶ A Teaching Laboratory containing 25 IBM machines can be scheduled for classes
- ▶ A special workstation cluster for open use of expensive, special-purpose hardware and software

Computing Research Laboratory

Sergei Nirenburg
646-5466

The NMSU Computing Research Laboratory was established by the New Mexico legislature as a Center of Excellence for applications in artificial intelligence. An interdisciplinary laboratory with researchers from three university departments, the laboratory focuses on knowledge-based programs, particularly those implemented in a parallel programming environment. In addition, the laboratory has three SUN/Lisp machine software labs. The laboratory works closely with Sandia National Laboratories and the Los Alamos National Laboratories as well as with federal agencies, IBM and other companies. The lab has an industrial affiliates program offering artificial intelligence abstracting services, artificial intelligence teaching, and joint research.

Consortium for International Development

Harold Matteson
646-3199

New Mexico State University is a member of the Consortium for International Development (CID), which is a nonprofit corporation representing eleven publicly supported universities in the western United States. Its members believe that they must address the important international issues of their times. Certainly the poverty and struggle of people in the developing world are among the most pressing issues we face today in economic, ecological, social, and moral terms. Hunger, malnutrition, poverty, environmental degradation, poor health, and limited education are immense problems; we believe we can contribute to their solution. CID universities wish to participate in significant efforts to create a more just, peaceful, and self-reliant world. To this end, CID is committed to providing superior quality resources to development projects worldwide.

For the past twenty years, CID has offered outstanding research, education, and extension programs that help solve problems faced by developing countries. Its eleven universities are committed to sharing their technical and educational expertise worldwide. CID performs all phases of international development work: problem assessment and project development, design, planning, implementation, reporting, and evaluation.

The Consortium is comprised of New Mexico State University, University of Arizona, University of Idaho, California State Polytechnic University, Colorado State University,

Cooperative Extension Service

Jerry Schickedanz
646-3016

The New Mexico State University Cooperative Extension Service offers community-based education in agriculture, natural resources, family well-being, and community development. With the support of state, county, federal and private funding, the Cooperative Extension Service provides education that is put to immediate use to enhance the quality of life for participants, through economic and business development, 4-H youth programs, home-oriented management, and natural resource stewardship.

Offices in every county are affiliated with county governments, which partially fund staff in those offices. Formula and special project funds come from the U.S. Department of Agriculture. State funds are dedicated to Cooperative Extension as a line item of the higher education budget. Private grants and contracts support projects such as the Rural Agricultural Revitalization and Public Affairs project in north-central New Mexico, funded by the W.K. Kellogg Foundation.

In addition to on-going support of locally identified clientele needs, Extension emphases include: sustainable agriculture programs, which support economically and environmentally sound agriculture enterprises; youth-at-risk programming, aimed at preventing detrimental youth behaviors; water quality programs, aimed at protecting the integrity of our water supply; and rural tourism development programs.

Corona Range and Livestock Research Center

Bobby Rankin
646-2515

The Corona Research Center consists of approximately 28,000 acres located about ten miles east of Corona, New Mexico in the central part of the state. Elevation is around 6,000 feet and annual precipitation averages near 14 inches. About one-third of the ranch is covered with pinyon and juniper woodlands and about two-thirds is open grassland. Research on nutrition, management and reproduction of range beef cattle and sheep is planned for the center. An abundant mule deer population is being monitored. The effects of all programs on range productivity will be measured. Control of noxious plant species, grazing management, range fertilization and watershed characteristics will also be studied.

The center is staffed by a superintendent and two research technicians. A bunkhouse is available for scientists and graduate students who commute from the main campus at Las Cruces to conduct research. Superintendent E.E. Parker may be reached at (505) 849-1015. This research unit is operated by the Animal and Range Sciences Department.

Cotton Fiber Laboratory

Carl L. Roberts
646-1507
646-4516

The laboratory provides sampling and analysis on cotton fiber from October through April. Students are employed to evaluate all breeding material, yield plots located throughout the state, and to measure length, strength and fiber fineness. The laboratory is controlled for temperature and humidity. During the months of April and May, planning begins for the following year's testing and evaluation.

Digital Mapping Laboratory

Albert Peters
646-1892

Research personnel in a number of departments at New Mexico State University rely to an increasing degree upon the remote sensing and geographic information system capabilities of the Digital Mapping Laboratory. Although the lab is based in the Geography Department, it is a university-wide resource crucial to the university's teaching, research and service responsibilities.

Specific courses taught in the Geography Program which depend on the Digital Mapping Laboratory include: Introduction to Remote Sensing, Advanced Remote Sensing, Seminar in

Remote Sensing, Introduction to Geographic Information Systems, Seminar in Geographic Information Systems, Spatial Analysis, and Computer Cartography. Enrollment in these courses include undergraduate, master's and doctoral students.

Educational Research Center

Roy Rodriguez
646-1500

The Educational Research Center was organized in 1969. Its purposes are to:

- ▶ encourage research and training within the College of Education;
- ▶ provide consultant, research and evaluation services for schools and educational agencies;
- ▶ coordinate off-campus courses with the College of Human and Community Services; and
- ▶ provide space and equipment for research and training projects where possible.

The center assists faculty and staff in locating possible funding sources, communicating with agency personnel and preparing proposals, providing limited funding for publication costs and travel, and distributing research and development minigrants.

The center currently houses center staff, the MIS/VTIS Project, which collects, manages and maintains a secondary and post-secondary vocational education database for the state of New Mexico; Las Cruces Child Care Resource and Referral; and four preschool programs, which include a gifted program, Head Start program, Tots/Tresco (school for the handicapped), and morning and afternoon regular preschool classes.

Electro-Optics Laboratory

Mike Giles
646-3833

The educational laboratory consists of a variety of optical and electronic components enabling students to perform experiments in lasers, optical fibers, coherent optical processing, radiometry, detectors and incoherent optical systems. Specialized equipment used in these experiments includes blackbodies, photodiodes, photomultipliers, filters, lenses, a scanning Fabry-Perot interferometer, radiometers and lasers. Most of the specialized equipment used in these laboratories was obtained under a DOD/University Research Instrumentation Grant.

Engineering Research Center

Larryl Matthews
646-3422

Engineering research studies started at New Mexico State University as early as 1930. In 1957, with the appointment of a full-time staff, the center became established as part of the organized research program of the university.

Financial support for Engineering Research Center activities comes from state appropriations, local, state, and federal agencies, and private industry. In 1993, outside funding support was approximately \$14 million, more than doubling its funding since 1990 and continued vigorous growth is anticipated.

The purpose of the Engineering Research Center is to promote engineering and industrial development of the state and nation. Increased knowledge from basic and applied research is an important responsibility of a state university. The opportunity to take part in national and regional research endeavors is an incentive to bring more well-trained staff members to the university. The opportunity for graduate students to participate in research projects adds an important dimension to their training. Advanced undergraduate students can also gain research experience on station projects.

The center assists all faculty and staff members of the College of Engineering and collaborating faculty in departments outside the college such as economics, agriculture, physics, chemistry, biology and business administration in obtaining research funding.

Geographic Applications and Research Laboratory

*Robert Czerniak
David Garber
646-3509*

The purpose of the Geographic Applications and Research Laboratory is to provide a university focus for research and teaching in computer mapping, geographic information systems and the interpretation of satellite imagery.

The lab has completed several projects for local governments in New Mexico. The projects include: developing computerized rural addressing atlases; producing computerized map series for Hatch and San Juan County; creating a land use and zoning comparison for the cities of Socorro and Las Vegas, assessing pastoral biomass in Niger; and developing a normalized difference of vegetation index for New Mexico. In addition, the lab has provided training for over 100 local and foreign government officials and more than 200 students have used the laboratory for class work.

Geothermally Heated Incubator Greenhouses

*Rudi Schoenmackers
646-1846*

The Southwest Technology Development Institute manages and operates the NMSU Geothermal Greenhouse Facility. The greenhouse research and incubator facility includes two 6,000 square-foot greenhouses and features innovative geothermal heating and cooling systems, fully computerized environmental controls, and state-of-the-art film cover materials. The greenhouses are leased to commercial growers considering southern New Mexico for their operations.

Other greenhouse features include: fan and pad cooling system; fog cooling/humidification in one greenhouse; good quality fresh water; geothermal forced air heating; geothermal benchtop soil heating; rolling benches in one greenhouse; 2,400 square-foot adjacent warehouse space; office space within warehouse; and convenient access to interstate highway.

Wetlands research is conducted in an 800 square-foot greenhouse adjacent to the Geothermal Greenhouse Facility. An ongoing research project monitors physical and chemical parameters of various waste streams in real time.

The institute can perform geothermal and engineering technical assistance services, and assistance with permitting, regulatory compliance, geologic consultation, and aiding with overall project development.

International Institute for Resources Management

*Rossana Alvarez
646-2825*

The mission of the International Institute is to facilitate and conduct non-degree training and professional development, research, and advanced thought and discussion in natural, environmental and cultural resources management. The Institute extends the long-standing collaborative relationships between the University and the many public sector resources management entities in western states.

The strength of the institute's programming is derived from interaction with, and utilization of, its collaborators' experience-based expertise. The institute provides the vehicle for NMSU to deliver superior environmental, natural, and cultural resources management expertise for sustainable development.

The institute's training programs address participants' needs with a broad range of educational and professional backgrounds. The advanced thought programs are a key element in the institute's agenda setting process. The institute provides the intellectual and physical setting for forward looking debate and discussion of all aspects of natural, environmental and cultural resources management. The institute's collaborators and constituents participate in open discussion and debate on emergent issues influencing the course of research and training activities. The Institute also initiates symposia and programs, and sponsors visits and other activities of leading scholars and professionals. The research program is an outgrowth of institute activities in training and advanced thought. Research is oriented primarily toward developing information to support training activities.

Jornada Experimental Range

*Kris
Havstad
USDA-ARS
646-4842*

The Jornada Experimental Range is a facility of the Agricultural Research Service established in 1912. The Range is located 23 miles north of Las Cruces between the Rio Grande Valley on the west and the San Andres Mountains on the east. The range comprises nearly 200,000 acres. Historical data sets on vegetation change and climatic features date to 1915.

Both basic and applied research on the range are aimed toward sustainable development of rangeland resources. Current research interests fall within three specific objectives:

- ▶ to define the structure and function of range ecosystems, and to determine the natural and anthropomorphic stresses that govern establishment, growth, reproduction, and persistence of range plants
 - ▶ responses of plant communities to multiple stresses
 - ▶ symbiotic relations of desert grasslands and shrublands
 - ▶ secondary chemistry of native desert plants
- ▶ to develop new technologies for bioremediation of deteriorated rangelands
 - ▶ passive methods for rangeland seeding, including wind, water, and animal dispersal technologies
- ▶ to create innovative methods that manipulate livestock groups to achieve desired foraging behaviors
 - ▶ interactions of plant chemistry and livestock physiology
 - ▶ dietary behavior of free-ranging livestock
 - ▶ grazing behavior principles and their application to proper management

Jornada Long-Term Ecological Research

*Laura F. Huenneke
646-3933*

The Jornada Long-Term Ecological Research (LTER) program focuses on the ecological and biological processes causing, and caused by, desertification of semi-arid grassland to Chihuahuan desert shrublands. Funded by the National Science Foundation, the Jornada LTER is part of a national network of ecological research sites in a wide range of ecosystems. A consortium of investigators from NMSU and other institutions directs research at a variety of sites on the Jornada Experimental Range and the NMSU College of Agriculture Ranch. Research focuses on the effects of the historical conversion of black grama grassland to shrublands dominated by mesquite and creosote bush; the central hypothesis guiding LTER research is that shrubs play an important role in concentrating solid resources (nutrients and water) beneath the shrubs, while exacerbating the loss of resources due to erosion and runoff in between-shrub areas. The increasing heterogeneity of soil resources, in turn, reinforces the loss of grasses and the relative success of shrubs in the desertified environment. LTER work also is assessing the role that desertification of semi-arid lands can play in global climatic changes, as deserts are significant contributors of dust and of green house gases, and as global wind and albedo characteristics are influenced by desert areas. The Jornada LTER works with the Jornada Experimental Range to organize the annual Friends of the Jornada Research Symposium, in which scientists from NMSU and elsewhere present research results and discuss approaches to scientific work on the Jornada basin and other sites in the Chihuahuan desert. The LTER provides research support and infrastructure to many visiting scientists and students, as well as to other externally-funded projects based at NMSU. LTER funds support training and research expenses for several graduate and undergraduate student projects each year.

Dr. Bill Schlesinger of Duke University currently serves as lead principal investigator for the Jornada LTER. Dr. Laura Huenneke, NMSU Department of Biology, is the primary investigator based at NMSU.

Laboratory for Cartography and Spatial Analysis

Robert Czerniak
646-3509

The Laboratory for Cartography and Spatial Analysis was established in January 1984 to provide a center for research and applied projects in map-making and locational analysis. Laboratory facilities can handle both large and small format maps (up to 50" x 48") in either color or black-and-white, and a full range of aerial photographic interpretive facilities. The projects undertaken by the laboratory have ranged from base maps for small communities to aerial photographic interpretation of land use. Laboratory personnel have been involved in a number of planning projects, both small and large area as well as in producing comprehensive and base maps for the towns of Socorro and Anthony. Also, the lab is involved in the New Mexico State Aviation Plan. Laboratory faculty and staff are trained and have experience in statistics, land-use, transportation and environmental planning, and rural community development.

Microwave Laboratory Facilities

Russ Jedlicka
646-4932

The lab includes instrumentation for two antenna ranges and for the measurement of microwave device parameters. The microwave anechoic chamber may be described as follows: antenna and radar cross section; measurements in the 1-18 GHz range; Dimensions of 40' 12'x12'; minimum performance reflection levels are -30db at 1GHz, -45db at 3 GHz, -50db at 5.5 GHz; quiet zone at least 3' in diameter; supported by Scientific Atlanta measurement equipment.

A rooftop range with a path length of 183' using log-periodic transmit antennas with 1-11 GHz bandwidth is available. Test antenna can be remotely positioned from 5' to 29' above the roof. The phase-amplitude receiver is used for both the rooftop range and the anechoic chamber.

National Park Service - Office of International Affairs Mexican Affairs Branch

Howard Ness
646-3524

The National Park Service's Office of International Affairs, Mexican Affairs Branch is located with the Border Research Institute on the New Mexico State University campus. The office is responsible for coordinating National Park Service, Office of International Affairs' activities in Mexico and Latin America. Activities in Mexico range from joint initiatives with US Agency for International Development Mission Mexico, the Secretaría de Desarrollo Urbano y Ecologia, cooperative training activities with nongovernmental organizations such as the World Wildlife Fund and PRONATURA (Mexico), and consulting with the Tarahumara Indians on the development of cultural and recreational facilities in the Lago Arareco area.

The National Park Service\New Mexico State University collaborative effort to develop partnerships with NMSU and other federal agencies is a commitment to develop high-quality training activities. The activities are supported by the National Park Service's Southwest Region, with its headquarters in Santa Fe, New Mexico. The region includes northeast Arizona, New Mexico, Texas, Oklahoma, Arkansas and Louisiana.

The southwest region contains five of the National Park system's ten international boundary (Federal Republic of Mexico) sites in the lower 48 states. The largest of the sites is Big Bend National Park. Big Bend is a particularly rich site for the study and interpretation of natural and environmental phenomena. It also provides a remarkable array of opportunities to examine issues involving international resources and environmental management conflicts, and cooperation. The Rio Grande Wild and Scenic River represents a complementary situation for the study of resources management, like Project del Rio, and institutional issues.

The National Park Service Southwest Region International Boundary sites include:

- ▶ Amistad Recreation Area, Texas
- ▶ Big Bend National Park, Texas
- ▶ Chamizal National Memorial, Texas
- ▶ Rio Grande Wild & Scenic River, Texas
- ▶ Palo Alto Battlefield National Historic Site, Texas

The southwest region's single coastal site is the Padre Island National Seashore. The site is of particular interest and importance because of the international implications of managing the Kemps Ridley-Rancho Nuevo marine turtle.

The National Park Service Southwest Region Coastal site:

- ▶ Padre Island National Seashore, Texas

Many sites in the southwest region provide interpretive opportunities for natural and cultural resources with clear parallels, if not direct linkages, to Central American situations. The remnants of vanished, ancient cultures and the Spanish Conquistadors provide particularly relevant and familiar opportunities for study. Some of the more prominent are:

The National Park Service Southwest Region Indian and Spanish Cultural Resource sites:

- ▶ Aztec Ruins National Monument, New Mexico
- ▶ Bandelier National Monument, New Mexico
- ▶ Canyon de Chelly National Monument, Arizona
- ▶ Chaco Culture National Historical Park, New Mexico
- ▶ El Malpais National Monument, New Mexico
- ▶ El Morro National Monument, New Mexico
- ▶ Gila Cliff Dwellings National Monument, New Mexico
- ▶ Navajo National Monument, Arizona
- ▶ Pecos National Monument, New Mexico
- ▶ Petroglyph National Monument, New Mexico
- ▶ Salinas Pueblo Missions National Monument, New Mexico
- ▶ San Antonio Missions National Historic Park, Texas

The remaining sites in the SW Region provide exposure to natural phenomenon or are historically relevant in a relatively recent context.

The National Park Service Southwest Region Natural Resources sites include:

- ▶ Big Thicket National Preserve, Texas
- ▶ Buffalo National River, Arkansas
- ▶ Carlsbad Caverns National Park, New Mexico
- ▶ Guadalupe Mountains National Park, Texas
- ▶ Hot Springs National Park, Arkansas
- ▶ Lake Meredith Recreation Area, Texas
- ▶ Alibates Flint Quarries National Monument, Texas
- ▶ Capulin Volcano National Monument, New Mexico
- ▶ White Sands National Monument, New Mexico
- ▶ Wupatki National Monument, Arizona
- ▶ Sunset Crater National Monument, Arizona
- ▶ Walnut Canyon National Monument, Arizona
- ▶ Chickasaw National Recreation Area, Oklahoma

The National Park Service Southwest Region Historical sites:

- ▶ Arkansas Post National Memorial, Arkansas
- ▶ Fort Davis National Historic Site, Texas
- ▶ Fort Smith National Historic Site, Arkansas
- ▶ Fort Union National Monument, New Mexico
- ▶ Hubbell Trading Post National Historic Site, Arizona
- ▶ Jean Lafitte National Historic Site & Preserve, Louisiana
- ▶ Lyndon B. Johnson National Historic Park, Texas
- ▶ Pea Ridge National Military Park, Arkansas
- ▶ Poverty Point National Monument, Louisiana

New Mexico Cooperative Fish and Wildlife Research Unit

Phillip Zwank
646-6053

The New Mexico Cooperative Fish and Wildlife Research Unit's mission is to facilitate cooperation among the National Biological Survey, New Mexico Department of Game and Fish, New Mexico State University and nongovernmental organizations conducting programs of research and education related to fishery and wildlife resources management. The specific focus for the unit is to conduct research directed toward the solution of problems of mutual concern related to fish, wildlife, and their habitats; provide academic training toward advanced degrees; provide technical assistance to federal, state, and other conservation agencies related to fish and wildlife management; and provide conservation education through publications, lectures and demonstrations.

The unit's strengths are in the areas of waterfowl ecology in wetlands and coastal zones, big game ecology and management, landscape level conservation practices, and the impacts of human/wildlife interactions on wildlife responses. Its research program focuses on the following issues:

- ▶ enhanced understanding of wetland ecology
- ▶ prediction of wildlife responses to habitat/people management strategies
- ▶ enhancement of human understanding and planning for urban wildlife
- ▶ understanding spatial and socioeconomic attributes of current and anticipated fish and wildlife user publics
- ▶ detection and interpretation of changes in land surfaces and ecosystems
- ▶ support of conservation efforts in Mexico with emphasis on those initiatives directly applicable to cooperators
- ▶ integration of consumptive and appreciative values of wildlife and fishery resources with sustainable agriculture and other land-use practices

The unit is involved in education and training, and personnel are actively developing the direction of related academic programming and teaching. Short courses, workshops and symposia are supported. The unit's communication and environmental education efforts employ the most current technology to facilitate information transfer among cooperators, agencies, academic institutions, and the general public.

It actively recruits, educates, and trains qualified females and ethnic minorities (with an emphasis on Hispanics) and works closely with the US Fish and Wildlife Service and other federal and state agencies to establish Cooperative Education Agreements to provide support and employment opportunities.

New Mexico Department of Agriculture

Frank A. DuBois
646-3007

The New Mexico Department of Agriculture, under the direction of New Mexico State University's Board of Regents, is responsible for administering laws and regulations that affect the daily lives of every citizen in New Mexico. These laws and regulations concerning the production, preparation, processing, sale and use of agricultural products, weights and measures, and petroleum products are designed to assist producers, processors, and consumers.

The department's marketing program provides guidance to commodity groups in the promotion of agricultural products. The director is the New Mexico Secretary of Agriculture and serves on the governor's cabinet as a liaison between state government and the agricultural industry.

New Mexico Water Resources Research Institute

Tom Bahr
646-4337

The New Mexico Water Resources Research Institute at NMSU, founded in 1963, was the first such organization in the United States. The institute's program encompasses all state universities in New Mexico and public agencies sponsoring water research. It serves as a coordinator, assisting researchers in obtaining funds, working with granting agencies, and serving as the administrator for projects. The annual \$1.3 million budget is 47 percent state and private sources and 53 percent federal funds. All research projects administered by the

institute encourage graduate student participation. As a result, about 100 students a year receive scientific training through institute-sponsored projects.

Each year, the institute's director, in consultation with the institute's Program Development and Review Board, identifies critical New Mexico water issues and solicits research and development proposals that address New Mexico's water needs. During a typical year, about 25 research projects are supported through the institute. Recent projects focused on groundwater quality problems such as the effects of sewage lagoons and sewage sludge application on groundwater quality; theoretical modeling of chemical and organics transport in soils; aquifer permeability; landslide erosion and runoff studies; genetic engineering research aimed at improving plant/water efficiency; economic study of groundwater depletion in New Mexico's confined aquifers; and experimental field tests to investigate the relationships among water applied, physical soil characteristics, antecedent moisture conditions and resulting flow paths. The institute publishes the research results of every project it administers and several miscellaneous reports annually.

The Annual New Mexico Water Conference, sponsored by the institute, has provided a public forum for state water issues since 1956. The public participation helps the institute focus its research program on areas of greatest need. The institute also maintains a water resources library of more than 8,000 water-related publications and works to educate the general public on water issues facing New Mexico.

Physical Science Laboratory

Robert Weigle
522-9200

The Physical Science Laboratory was founded in 1946 as a nonprofit research, development, test, evaluation, and engineering support contract agency for NMSU. It is a multi-discipline entity engaged in national and international activity. Primary emphasis is on defense and space-related technology. The laboratory exists to assist federal agencies satisfy research development needs; to attract high-caliber faculty, professional staff, and students to NMSU; and provide meaningful employment opportunities for students.

Personnel participate in research and development programs conducted in laboratory facilities located on the campus as well as in government facilities such as the White Sands Missile Range; Holloman Air Force Base; Goddard Space Flight Center, Wallops Island, VA; and the NASA National Scientific Balloon Facility in Palestine, TX.

The laboratory is responsible for nearly all high-altitude research balloon launches made in the United States, and many other launches from sites in Australia, Canada, and Antarctica. It operates the National Scientific Balloon Facility for NASA and is currently evaluating the feasibility of high altitude, long-duration flights. The lab conducts major research and development programs for the military.

The laboratory provides environmental engineering and documentation services to Department of Defense and Department of Energy organizations in New Mexico and Arizona, and for the National Science Foundation/Associated Universities, Inc. at the Socorro National Radio Astronomy Observatory. In 1993 the contracted services included preparation and publication of National Environmental Policy Act Environmental Impact Statements, Environmental Assessments, and provision of environmental compliance monitoring services for a construction project at White Sands Missile Range. The Environmental Group has capabilities for conducting ecological system surveys, Threatened and Endangered Species surveys, Cultural Resources Management Assessments, geological and hydrological assessments, geotechnical investigations, air quality surveys and assessments, noise surveys and assessments, industrial hygiene/environmental health and safety studies, socio-economic studies, and hazardous waste management assessments. The Laboratory's environmental geographic information systems laboratory operates state of the art geographic and cartographic equipment capable of producing the full range of color based geographic and engineering thematic products.

In 1992, contracts exceed \$40 million. A staff of 600 engages in research and development in electromagnetic technology; telemetry; satellite instrumentation and control systems; data reduction, processing, and analysis; real-time digital system programming; and operations research.

Throughout the years, the lab has employed more than 14,000 students. Graduate students in the engineering, scientific, and technical writing fields are eligible for individual graduate study programs based on laboratory projects.

Plant Genetic Engineering Laboratory

John Kemp
646-5453

The Plant Genetic Engineering Laboratory for Desert Adaptation is one of two centers of excellence on the New Mexico State University campus established as part of the Rio Grande Research Corridor in New Mexico, a network of state and federal research and development facilities aimed at stimulating economic development within the state in selected areas of high technology through technical innovation and technology transfer. The laboratory's mission is to provide a mechanism for interdisciplinary research, development and training activities related to the applications of biotechnology for crop/plant improvement.

Research and development efforts focus on genetic tolerance to environmental stress; genetic tolerance to pest stresses; and new product development. This mission is dependent on research in appropriate aspects of stress physiology and biochemistry, molecular biology, molecular and cellular genetics, and classical genetics and breeding.

Research scientists are faculty members of various departments on campus, including chemistry, agronomy and horticulture, biology, and entomology, plant pathology, and weed science. The lab works closely with the molecular biology graduate program on campus. Special courses supporting academic training in this area have been developed and are offered by these departments. Collaborative research, development and training activities are conducted with private industry and other Rio Grande Research Corridor members, including Los Alamos National Laboratory.

The laboratory offers opportunities for collaborative research grant support from external sponsors. Many opportunities for graduate student training in laboratory, greenhouse and field research projects exist through direct lab support and through the grant programs generated by participating faculty scientists. State-of-the-art facilities are expanding to support these efforts.

Plant Pathology Laboratory

Craig Liddell
646-4110

Plant diseases, caused by microorganisms such as fungi, bacteria, viruses and nematodes, limit agricultural production in New Mexico and may provide novel ways to manage weeds on rangelands. Research in plant pathology at NMSU is concerned with diseases primarily caused by fungi and nematodes. Specific research concerns soilborne pathogens of peppers, onions, cotton and peanuts and foliar diseases of peppers, peanuts and rangeland weeds.

There is also some exciting new work in computer modelling of fungi, plants and plant diseases being conducted by NMSU plant pathologists in conjunction with the NMSU Computing Research Laboratory.

The control of rangeland weeds in an environmentally sound manner is a priority at the laboratory and various methods of biological control of broom snakeweed using plant pathogens are being investigated.

Rio Grande Research Corridor

Averett S. Tombes
646-2022

The Rio Grande Research Corridor stretches from Los Alamos in northern New Mexico to the White Sands Missile Range and Las Cruces in the south. The corridor has one of the highest concentrations of internationally recognized scientific and technological expertise in the world. The Rio Grande Research Corridor formally links federal and state laboratories and engineering facilities, universities, private companies and other organizations into a partnership. The partnership has the common goal: to attract clean, advanced-technology-

based industry to New Mexico and to commercialize the technology developed in New Mexico to provide more jobs and prosperity for the state's citizens.

The interactions of many of the corridor's constituent entities is facilitated by New Mexico Technet. Technet is a state sponsored organization which unites research institutions in higher education with state government, industry and national laboratories through a digital network. Technet provides data and video services to its constituents as well as the physical connections to other networks. Services include access to commercial, government, and academic databases, and special communications services. Technet is a component part of Internet. Internet is a national network that connects educational and research institutions throughout the country. Westnet (connecting 5 western states) and NSFNET (connecting NSF sponsored supercomputers) are also part of Internet.

Southwest Center for Environmental Research and Policy

Erin Ross
646-5255

The Southwest Center for Environmental Research and Policy is a US-Mexico, public-private sector consortium representing Texas, New Mexico, Arizona, California, Utah and the border states of Mexico. These states are represented by the University of Texas at El Paso, New Mexico State University, Arizona State University, the University of Utah, San Diego State University, the Instituto Tecnológico y de Estudios Superiores de Monterrey and the Instituto Tecnológico de Ciudad Juarez.

The consortium is supported by funding appropriated by the US Congress through the Environmental Protection Agency. The funding was established by Congress to conduct research, develop abatement and control techniques, carry out technical and policy studies and programs; develop environmental education and training programs, and implement projects and activities to address problems that threaten the environmental health, safety, welfare and economic development of the Southwest border region of the United States and Mexico. The consortium works in cooperation with the U.S. Environmental Protection Agency and the Secretaria de Desarrollo Urbano y Ecología of the Government of Mexico.

The center's mission is to focus collective academic, clinical, technical, business and legal program resources of the consortium, the Environmental Protection Agency, Secretaria de Desarrollo Urbano y Ecología, and other cooperating public and private organizations and institutions, and to address the following environmental issues:

- ▶ hazardous chemicals and toxic waste management, containment, transportation, and disposal;
- ▶ air and water quality, pollution research, abatement and control;
- ▶ water quality and quantity research and technology;
- ▶ energy technologies and environmental issues related to such technologies;
- ▶ wastewater treatment technology;
- ▶ drinking water availability and research;
- ▶ pesticide research and technology;
- ▶ prevention and control of environmental pollution induced health problems; and
- ▶ environmental education and training.

Southwest Consortium on Plant Genetics and Water Resources

John Kemp
646-5353

New Mexico State University, Los Alamos National Laboratory, Texas Tech University, the University of Arizona and the University of California at Riverside have participated since 1986 in a cooperative program to advance water and biotechnology research aimed at solving the specific problems of desert agriculture. Currently funded by the USDA, the consortium uses a mini grant process to provide seed money support to innovative research relevant to arid and semi-arid lands. A focus is placed on interdisciplinary approaches with consideration given to commercial transfer potential.

Specific research objectives include the evaluation of 1) tolerance to biophysical and biochemical stresses in desert plants and agronomically important arid/semi-arid region crop species, 2) the impact of stresses on susceptibility of plants to pests and pathogens, as well as on the activities of symbionts and beneficial organisms, 3) genetic modifications of plants that

are targeted for better adaptability to the stresses of semi-arid areas and the problems of water use efficiency and water quality. Some of the specific areas of current study include: characterizing genetic markers associated with salt tolerance, determining cotton varieties with high tolerance to herbicides, studies on the effect of night temperature on the growth dynamics of cotton, identification of genes involved in nematode infestation of alfalfa, studies on root growth potential of various cottons, and identification of a factor involved in nitrogen fixation in plants.

The Southwest Consortium was established to deal with the unique problems associated with arid land agriculture. These problems are complex and interrelated and, as such, the solutions must be focused and interdisciplinary. The approach of the Southwest Consortium is to focus on efficient use and protection of water resources and to involve the expertise and discipline of five outstanding institutions.

Participating Institutions

Los Alamos National
Laboratory

The laboratory's Life Sciences division excels in the fields of molecular biology and genetic engineering, and includes three national resources: GeneBank, a computerized resource of all published gene sequences; the National Flow Cytometry Resource; and the National Stable Isotopes Resource. Research in the earth sciences includes geochemistry, hydrology, geophysics, and modelling, particularly the movement and chemistry of the groundwater and atmosphere. The laboratory also has a 21-acre facility dedicated to water and soil research.

New Mexico State
University

NMSU and its Plant Genetic Engineering Laboratory have strong expertise in molecular and cellular genetics. Landmark contributions have been made in the techniques of gene splicing and plant regeneration through tissue culture. The Water Resources Research Institute supports soil, water and crop scientists.

Texas Tech University

The College of Agricultural Sciences has strong research program in morphological, physiological, and biochemical plant characteristics that facilitate plant survival and productivity under conditions of drought and stress. Researchers offer expertise in cell culture and embryogenesis, cytogenetics, and the physiological and biochemical mechanisms of stress tolerance.

University of Arizona

The university has strong multidisciplinary programs addressing the problems of arid land agriculture. Its College of Agriculture has excellent facilities supporting work with tissue culture, recombinant DNA, microbial transformation, studies of gene structure and function, and allied fermentation chemistry.

University of California

Scientists have made distinguished contributions in entomology, plant pathology, nematology, soil and environmental sciences, and botany and plant sciences. The Centers of Excellence in Biotechnology, Plant Productivity, Toxicology, Energy Research, Analytical Chemistry, and Integrated Pest Management employ multidisciplinary approaches to complex problems of modern agriculture.

Southwest Region Experiment Station

Rudi Schoenmackers
646-1846

The station is a three-acre test and evaluation facility initially established by U.S. Department of Energy funding in 1980 to study residential utility connected solar electric (photovoltaic) systems. The station is managed and operated by the Southwest Technology Development Institute and is now a photovoltaic system test and training facility, with 12 buildings on site with about 40 kilowatts of mounted photovoltaic systems. Both stand-alone and utility connected systems are installed. Staff provide system design, construction, training, testing and evaluation for numerous private and public organizations, including Sandia National Laboratories, U.S. Department of Energy, the National Renewable Energy Laboratory, and the Electric Power Research Institute.

Institute staff has tested photovoltaic systems throughout the U.S. and Latin America. It has designed and installed fixed and portable data acquisition systems for a wide range of energy projects including photovoltaic, wind and solar thermal. The institute has designed and built an I-V curve tracer used for testing the output power of photovoltaic systems and has written a manual for system testing and a design handbook for Sandia National Laboratories.

Staff has helped the United Nations and various countries introduce photovoltaic power systems to developing regions, and offers international training programs on design and applications as well as instrumentation and data acquisition of solar and wind energy systems. The institute has trained professionals from China, Costa Rica, El Salvador, Germany, Ghana, Guatemala, Holland, Honduras, India, Israel, Italy, Nicaragua, Mexico, Mongolia, Panama, and Saudi Arabia on solar energy applications and data acquisition systems. Mexican activities include solar/wind resource assessments, village load assessments, monitoring existing sites, Spanish language solar/wind energy training (in Mexico, U.S., and Guatemala), and photovoltaic/hybrid systems monitoring and evaluation. Further, the institute also designs, installs, and tests 1,000 watt power supplies for Antarctica long-duration high-altitude weather balloons and conducts on-site energy audits for powerhouses in Antarctica with Sandia National Laboratories.

Southwest Technology Development Institute

Rudi Schoenmackers
646-1846

The Southwest Technology Development Institute's mission is to provide applied research services in energy-related technology development to private and public sector clients. Technical areas under investigation by the institute at this time include solar, geothermal, and energy efficiency. The institute's focus is to help stimulate New Mexico's economic base through commercialization of promising technologies in selected market niches. The institute provides contract services for systems analysis, hardware development and evaluation, feasibility studies, and computer-assisted modeling. These services are enhanced through the utilization of unique facilities managed, operated or accessible by the institute, including: the geothermal greenhouse research facility, Southwest Region Experiment Station for photovoltaic systems, and the heating, ventilation, and air conditioning test facility.

University Library

Timothy McKimmie
646-7483

University library resources are housed in two buildings: Branson Hall, built in 1951, contains agriculture, business, engineering, health and sciences collections; and New Library, completed in 1992, houses the works on the arts, education, humanities, and social sciences. Together, the number of book volumes contained in the libraries exceeds 800,000, of which some 70,000 volumes are bound U.S. Government documents. More than 610,000 pieces are on microform. Other resources include 50,000 unbound government documents, 40,000 maps, and growing collections of pamphlet materials. Some 6,900 periodical and serial subscriptions, and major newspapers are received.

The NMSU library is medium-sized with a strong basic core collection in the sciences. The chemistry journal collection is strong, as is the collection in civil engineering. There is a good basic collection in agriculture and the government documents collection is excellent. The Water Resources Research Institute on campus has a good collection as well. CD-ROM indices include Science Citation Index, Agricola, Water Resources Abstracts, and Enviro/Energyline. The library also has extensive collections dealing with southwestern United States and Mexican Border issues.

Books are classified according to the Library of Congress system. The on-line catalog includes entries of all materials. Loan rules are liberal, and the library is open to anyone, but preference must, of course, be given to students, faculty, and staff members. Interlibrary loan arrangements are maintained with many libraries.

Special Collections houses the library's rare and unique published materials. Archives houses two major collections of unpublished materials, the Rio Grande Historical Collections and the Hobson-Huntsinger University Archives.

Library holdings have, since 1971, been registered in the OCLC, Inc., bibliographic data base, which is computer-searchable. The library also makes available subjectsearchable, on-line data bases. CD-ROM application is available for some data bases.

Library Support of Natural Resources and Environmental Studies

Current and future acquisition of library materials will support teaching, research, and general informational needs in the fields of natural resources and environmental studies. Additional library acquisitions will support a new engineering program focusing on environmental studies as well as other relevant university programs.

Environmental studies has many facets and appears in the university curriculum in a variety of courses. While there is no academic department of environmental studies at NMSU, undergraduate and graduate courses relating to the environment and natural resources are taught in many departments. Related disciplines include agriculture, economics, engineering, biology, fish and wildlife science, chemistry, geology, sociology, health sciences, political science, and psychology. Students not necessarily in an environmental course also use library materials dealing with environmental subjects. An increase in the use of library materials dealing with natural resources and environmental issues has been noted. Information on topics such as recycling, use of toxic chemicals in the home, urban ecology, waste management, and environmental impacts are examples of areas likely to be overlooked by individual departments in their collection profiles. Therefore the library has made a special effort to obtain resources broad enough to include these aspects of environmental studies.

University Statistics Center

Ronnie L. Byford
646-2936

The University Statistics Center is committed to providing competent and timely statistical assistance, in the form of data processing and statistical design and data analysis, to all members of the NMSU community upon request. This service has been provided since 1969, when the center was founded. The service is usually cost free; however, if the work is directly related to a project funded through external funds, it is customary for the center to recover its expenses from these funds. This cost-recovery policy does not apply to service provided to graduate students on their master's or Ph.D. research, or to other research directly funded only through internal sources.

Waste-management Education and Research Consortium

Ron Bhada
646-2038

The Waste-management Education and Research Consortium is a world class research, education and technology transfer effort by four New Mexico institutions of higher learning, two national laboratories and the US Department of Energy. The goal of the consortium is to develop resources and address issues associated with environmental management. The participants are New Mexico State University, the University of New Mexico, the New Mexico Institute of Mining and Technology, and the Navajo Community College along with Los Alamos National Laboratory and Sandia National Laboratories.

The consortium's goal is to provide educational and research opportunities to all professional levels serving the environmental field. It supports undergraduate and graduate programs at the master's and Ph.D. levels at its member institutions. An important component of the programs is the acquisition of expertise in waste management and environmental restoration via hands-on independent leading edge technology development projects.

The consortium has four Educational/Research Laboratories which interface directly with its educational programs. The labs are:

- ▶ **Soil-Water-Air Testing and Research Facility:** Located on the NMSU campus, this facility provides analytical services for toxic and hazardous wastes and is equipped for physical, inorganic, and bacterial analyses of soil, water, air and plants.
- ▶ **Environmental Radioactive Measurements Facility:** This facility is involved in non-destructive classification and quantification of radioactive waste as well as environmental research in contamination pathways and geological characterization.
- ▶ **Hobbs Oil-Water Experimental Facility:** This facility provides services related to environmental and waste concerns of the petroleum industry in the United States. These

include secure storage, hand and machine tools, laboratory supplies, analytical equipment, and technical administrative and clerical support.

- ▶ Navajo Dryland Environments Laboratory: The laboratory has been established as a pilot project to address problems of experimental geology and geochemistry in arid and semi-arid regions. Preliminary research focused on groundwater quality and reclamation of abandoned mining areas.

In 1991 the Navajo Community College began environmental-related initiatives, including laboratory and environmental training, for Native American students. In addition to its academic activities, the consortium supports a program of off-campus training for continuing professional education for engineers and scientists involved in environmental management activities in industry and government.

The program offers an annual series on environmental issues via a satellite TV system. These series are aimed at preparing professionals in the workforce using state-of-the-art techniques. Approximately 2000 professionals in 84 organizations throughout the US have participated in this program. WERC also conducts an annual design contest for universities throughout the US and Mexico. Twenty-five universities participated in the most recent contest. The Carlsbad Environmental Monitoring and Research Center has been established under WERC to obtain independent environmental data in the area around the WIPP site.

**FACULTY AND STAFF
PROFILES**

Neal W. Ackerly
 Sociology and Anthropology
 Arts and Sciences
 Box 30001 Dept. 5700 Kent Hall 207
 Phone 646-2520 FAX 646-1419 E-Mail

Interests archaeological site surveys, irrigation systems of the Middle Rio Grande basin, palynological evidence of vegetation change in south-central New Mexico, radiometric dating of non-cultural soils in south-central New Mexico

Publications

Ackerly, N.W. 1991. Ethnographic patterns of pinon nut use in the greater Southwest. Prospects for Commercialization of Pinon Nut Production in New Mexico. Hearings before the New Mexico State Legislature, March 12, 1991, Santa Fe, NM.
 Ackerly, N.W. 1991. Late prehistoric archaeological evidence for the use of wild beans, *Phaseolus filiformis* Benth. *J. Ethnobiology*. (Submitted).
 Ackerly, N.W. 1991. Review of Kelley and Hanen's *Archaeology and the Methodology of Science*. *Newsletter of Palynology*. (In press).
 Ackerly, N.W. and S.J. Lee. 1991. An Annotated Bibliography of the Archaeology of New Mexico: 1970-1990. State of New Mexico. (In press).
 Ackerly, N.W. 1991. Using historic documents to develop analog models of processes affecting prehistoric Hohokam irrigation systems. Occasional Papers. Arizona Archaeological Council, Tempe, AZ. (In press).
 Ackerly, N.W. and T.L. Powell. 1991. Land Subjugation Patterns Among Historic Anglo Canals in the Duncan Valley, Arizona. (In preparation).
 Ackerly, N.W. 1990. Cultural resources on state of New Mexico trust lands: A status report. New Mexico State Land Trust Assessment: 1990. Miscellaneous Report No. M23. New Mexico Water Resources Research Institute, New Mexico State University, Las Cruces, NM.
 Ackerly, N.W. 1990. Review of the archaeology of the San Xavier bridge site (AZ BB:13:14), Tucson Basin, Southern Arizona. *Amer. Antiquity*. 55:2:438-439.
 Ackerly, N.W. 1990. Historic and prehistoric cultural resources of the SR 70 and Alameda historic district, Dona Ana County, New Mexico. New Mexico State University, Center for Anthropological Research Report No. 682, Las Cruces, NM.
 Ackerly, N.W. 1990. Playa margin adaptations in the southern Jornada del Muerto: The Isaack's lake playa survey. New Mexico State University, Center for Anthropological Research Report No. 684, Las Cruces, NM.
 Hart, J.M. and N.W. Ackerly. 1990. The 1990 Ropes Review: Identification of Research and Funding Priorities in the Mimbres Resource Area. Submitted to the Bureau of Land Management, Las Cruces District Office.
 Willmer, A.J. and N.W. Ackerly. 1990. An archaeological survey of three historic sites at Newman, Otero County, New Mexico. Archaeology Notes No. 11. Office of Archaeological Studies, Museum of New Mexico, Santa Fe, NM.

Research Support

N.W. Ackerly	<i>Prehistoric Playa Margin Adaptations on the Jornada del Muerto</i> - New Mexico State Historic Preservation Office	\$60,000 multi-year
N.W. Ackerly	<i>Irrigation Systems of the Middle Rio Grande basin</i> - New Mexico State Historic Preservation Division, EBID and El Paso Lower Valley Water District Authority	\$90,000 multi-year
N.W. Ackerly	<i>Spanish Colonial Period in El Paso, TX</i> - State of Texas	\$38,000 to date
N.W. Ackerly	<i>Palynological Evidence of Vegetation Change in South-Central New Mexico</i> - Funded from various sources	ongoing
N.W. Ackerly	<i>Dendrochronological Inquiries in South-Central New Mexico</i> - Collaborating with the Tree-Ring Lab in Tucson - Funded by various sources	ongoing
N.W. Ackerly	<i>Radiometric Dating of Non-Cultural Soils (Playas) in South-Central New Mexico</i> - Funded by various sources	ongoing

N.W. Ackerly	<i>An Archaeological Survey of a Proposed Road in Hidalgo County, NM</i>	\$1,100 2/92-5/92
N.W. Ackerly	<i>Archaeological Study on County Road Project C098, Hidalgo County, NM</i>	\$8,396 5/92-7/92
N.W. Ackerly	<i>Survey of Historic Acequias of the Rio Mimbres, New Mexico - New Mexico</i> Historic Preservation Agency	\$20,000 7/92-8/93
N.W. Ackerly	<i>Historical Study of the Velarde Vicinity of the Rio Grande Valley - New Mexico</i> Historic Preservation Agency	\$50,000 1/94-9/94
N.W. Ackerly	<i>Cultural Resources Consulting - DOD/Army (proposal submitted)</i>	\$1,151,174 10/93-9/96

Related Team Efforts

Tree-ring studies (regional)
Plant pollen studies (regional)

Special Facilities and Holdings

Equipment: Map-o-Graph optical map transfers (available); Magellan Nav 1000 pro GPS system (selectively available)
Bibliographies: Annotated bibliography of New Mexico archaeology (available)
Datasets: US Census Records: 1885-1920 (available); Juarez Municipal Archives: 1680-1880 (available); Rio Grande discharge records: 1889-present (available); Mesilla/Las Cruces/El Paso maps: 1852-present (selectively available); State Engineer/Bureau of Reclamation files (limited availability)

Christopher D. Allison

Cooperative Extension Service - Animal Resources
Agriculture and Home Economics
Box 30001 Dept. 3AE Knox Hall 319
Phone 646-1944 FAX 646-5441 E-Mail

Interests grazing management, range animal nutrition, toxicology

Research Support

C.D. Allison *Dietary Composition of Cattle Grazing Locoweed Infested Ranges -*
D. Graham *Preventative management strategies and therapy of affected animals*

C.D. Allison *Snakeweed component of range cattle diets*
D. Graham

Related Team Efforts

Member of Range Improvement Task Force. Interdepartmental group dedicated to range improvement and conflict resolution over management of rangelands.

Kelly W. Allred

Animal and Range Sciences
Agriculture and Home Economics
Box 30003 Dept. 3-I Knox Hall 321
Phone 646-1042 FAX 646-5441 E-Mail kallred@nmsu.edu

Interests plant taxonomy

Publications

- Allred, K.W. 1993. *A Field Guide to the Grasses of New Mexico*. Agricultural Experiment Station, New Mexico State University, Las Cruces, NM.
- Allred, K.W. 1993. Bromus, section Pnigma, in New Mexico, with a key to the bromegrasses of the state. *Phytologia*. 74:4:319-345.
- Allred, K.W. 1991. The biology of *Astragalus allochrous*: halfmoon locoweed (var. *allochrous*) and Wooten's locoweed (var. *playanus*). NM Agr. Exp. Sta. Res. Rpt. 652.
- Allred, K.W. 1991. Landscaping with native New Mexico grasses. *News. Nat. Pl. Soc. N.M.* 16:4-5.

Research Support

K.W. Allred	<i>Floristic Inventory of Diamond Creek Drainage - US Forest Service</i>	\$4,000 10/94-9/95
K.W. Allred	<i>Grasses of New Mexico - NM Agricultural Experiment Station</i>	
K.W. Allred	<i>Life History Studies of Locoweeds and Other Noxious Range Plants of New Mexico - NM Agricultural Experiment Station</i>	
K.W. Allred	<i>E.O. Wooten's 1904 Botanical Expedition in New Mexico - Cooperative Extension Service</i>	
K.W. Allred	<i>Manual of New Mexico Locoweeds - NM Agricultural Experiment Station</i>	
K.W. Allred	<i>Natural History of Western Grasses</i>	

Foreign Experience

Allred is a member of the Chihuahuan Desert Research Institute.

Special Facilities and Holdings

Facilities: Range Science Herbarium - 15,000 specimens available for study by bona fide researchers.
Datasets: Computerized dataset of New Mexico range plants (15,000 specimens).

Mark C. Andersen

Fishery and Wildlife Sciences
Agriculture and Home Economics
Box 30003 Dept. 4901 Knox Hall 126
Phone 646-8034 FAX 646-5975 E-Mail manderse@nmsu.edu

Interests conservation biology, mathematical modelling, spatial statistics

Research Support

M.C. Andersen *Spatial Analysis of LCTA Data - U.S. Army (White Sands Missile Range)*
P. Zwank

Tom G. Bahr

Water Resources Research Institute
Box 30001 Dept. 3167 Stucky Hall
Phone 646-4337 FAX 646-6418 E-Mail

Interests water resources management, water policy, water quality management, waste management

Publications

- Bahr, T. 1990. Identifying new research frontiers. *Proceedings of the 1990 Annual Meeting Universities Council on Water Resources*. West Point, NY, pp. 25-26.
- Bahr, T., B.J. Creel, C. Ortega Klett, and L. Blair. 1990. *New Mexico State Land Trust Assessment: 1990*. New Mexico Water Resources Research Institute Report No. M23, New Mexico State University, Las Cruces, NM.

Related Team Efforts

Bahr is the regional chair for the Colorado River/Great Basin region of the National Institutes of Water Resources. Bahr is also president of the Powell Consortium (covering the states of Arizona, California, Colorado, Nevada, New Mexico and Utah), a regional level water resources organization. Bahr also serves as the NMSU representative to the New Mexico/Texas Water Commission and is Chairman of the Southern New Mexico Public Entities Regional Water Planning Committee.

Carl E. Barnes

Agricultural Science Center/Artesia
Agriculture and Home Economics
Box 30003 Dept. 3BF
Phone 748-1228 FAX 748-1229 E-Mail

Interests high value crops, cotton production, alfalfa grazing

Publications

- Barnes, C.E. 1992. Alfalfa Cultivars. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1992. Asparagus Cultivars. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1992. Cotton Cultivars. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1992. Pima Cotton Cultivars. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1992. Gossym/Comax Growth Regulatory (PIX) Study. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1992. Cotton Nitrogen Fertility Scheduling Study. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. and B. Lewis. 1992. In Furrow Insecticide Treatment at Planting for Corn. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E., H.H. Jackson, and D.W. Albers. 1992. Gossym Comax Simulation of a Delta Variety in Two Diverse Environments. *Proc. Beltwide Cotton Conf.* Nashville, TN. 3:1075-1077.
- Barnes, C.E., N. Christensen, and J. Schroeder. 1992. Conservation Tillage System for Cotton. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1992. Potash Fertility in Cotton. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1990. Chile Variety Performance Trials. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1990. Asparagus Cultivars. Ag. Sci. Center Artesia Ann. Rpt.
- Barnes, C.E. 1990. Gossym/Comax Study. Ag. Sci. Center Artesia Ann. Rep.
- Barnes, C.E. 1990. Cotton Nitrogen Fertility Scheduling Study. Ag. Sci. Center Artesia Ann. Rep. 1990.
- Kiesling, H.E., A.M. Ali, E. Eloundou, J.S. Arledge, T.T. Ross, and C.E. Barnes. 1990. Nutritive value of alfalfa as influenced by cutting, location and baling. *Proc. West. Sec. Amer. Soc. Anim. Sci.* Reno, NV. 41:276-280.
- Malm, N.R., D.D. Davis, C.E. Barnes, C.L. Roberts, J.L. Fowler, and N.B. Christensen. 1989. Cotton Research. Ag. Exp. Sta. Spec. Rep. 89.

Research Support

- | | | |
|--|---|---------------------|
| C.E. Barnes | <i>Crop Cultivars</i> - state funding | |
| C.E. Barnes | <i>Crop Culture</i> - state funding | |
| C.E. Barnes
H. Kiesling
T. Ross
J. Libbin
M. Ortiz | <i>Alfalfa Grazing</i> - state funding | |
| C.E. Barnes | <i>Use of Plant Mapping in Crop Simulations</i> - Gossym-Comax,
Gossym-Comax Info Unit | \$750
7/90-12/90 |

Reldon F. Beck

Animal and Range Sciences
 Agriculture and Home Economics
 Box 30003 Dept. 3-I Knox Hall 326
 Phone 646-3537 FAX 646-5441 E-Mail

Interests range ecology, range management and improvement, livestock grazing on rangelands and relationships among biotic and abiotic components of ecosystems, cattle, plant response to grazing and non-grazing situations, diet composition, herbage response

Publications

Beck, R.F. and A.C. Grice. 1992. Conflicts over kangaroos. *Soc. Range Mgmt.* 45:P061.
 Beck, R.F., G.J. Millhollin, and C.D. Allison. 1992. A soil and vegetation inventory of a class A game park in southern New Mexico. *Soc. Range Mgmt.* 45:P047.
 Beck, R.F. and H.E. Kiesling. 1991. Livestock Research Briefs and Cattle Growers' Short Course, p. 78.
 Beck, R.F. and R.P. McNeely. 1991. Effects of continuous grazing on black grama range. *Soc. Range Mgmt.* 44:65.
 Tiideman, J.A., R.F. Beck and R.V. Ecret. 1991. Dependence of standing crop on range condition rating in New Mexico. *J. Range Mgmt.* 44:602-605.

Research Support

R.F. Beck *Seasonal Grazing - Ag. Exp. Station*
 J. Winder
 H. Kiesling

R.F. Beck *Goat Brush Control - Ag. Exp. Station*
 H. Kiesling

R.F. Beck *Brush Management/Herbicides - Ag. Exp. Station*
 K. McDaniel

R.F. Beck *Mesquite control efforts - Mr. and Mrs. Valentine* \$3,000
 1/90-12/94

Foreign Experience

Currently working with a group trying to develop a working relationship/exchange with China. Bob Lansford is the leader.

Related Team Efforts

Currently involved with a group of faculty that are trying to develop a working relationship/exchange with China. This includes faculty from Ag. & Engineering Colleges. Bob Lansford from Ag. Econ. is the leader.

Special Facilities and Holdings

Datasets: College Ranch grazing study - 25-year dataset on cattle performance as well as plant response.

Robert D. Berghage

Agronomy and Horticulture
 Agriculture and Home Economics
 Box 30003 Dept. 3Q Gerald Thomas 195
 Phone 646-5023 FAX 646-6041 E-Mail

Interests environmental plant physiology, controlled environments

Publications

- Berghage, R.D. and R.D. Heins. 1991. Quantification of temperature effects on stem elongation in poinsettia. *Journal of American Society of Horticulture Science*. 116:1:14-18.
- Berghage, R.D. and N.K. Lownds. 1991. Using writing in horticultural education. *HortTechnology*. 1:1:124-126.
- Berghage, R.D., N.K. Lownds, J.E. Erwin, and R.D. Heins. 1991. Circadian temperature effects on nutrient content of poinsettia leaves. *HortScience*. 26:6:713.
- Erwin, J. and R. Berghage. 1991. Temperature and light. *Tips on Growing Zonal Geraniums* (2nd ed.). Ohio State Coop Extension Bulletin FP-765, Agdex 281/15.

Research Support

R.D. Berghage W. Zachritz M. Olsen Univ. of Ariz.	<i>Integration of Aquaculture into a Greenhouse or Container Nursery Farm</i>	
R.D. Berghage W. Mueller W. Zachritz	<i>Agricultural Waste Water Remediation using Artificial Wetlands Filters - USDA/Cooperative State Research Service (proposal submitted)</i>	\$125,799 7/93-8/95
R.D. Berghage	<i>Integration of Aquaculture into an Irrigated Farm to Improve Efficiency of Water and Nutrient Use - US Department of Agriculture</i>	\$5,050 9/92-2/93
M. Wall R.D. Berghage	<i>HPLC for Postharvest Environmental Physiology - USDA/Cooperative State Research Service</i>	\$25,620 9/92-9/93
R.D. Berghage	<i>Integration of Aquaculture into an Irrigated Farm to Improve Efficiency of Water and Nutrient Use - University of Arizona</i>	\$10,300 9/91-12/93
J. Harrington R.D. Berghage	<i>Portable Photosynthesis Equipment for Environmental Physiology - USDA/Cooperative State Research Service (proposal submitted)</i>	\$13,635 9/93-8/94

Marvin H. Bernstein

Biology

Arts and Sciences

Box 30001 Dept. 3AF

Phone 646-3823 FAX 646-5665 E-Mail

Interests animal physiology

Research Support

M.H. Bernstein Ben Gurion Univ. of Negev	<i>Bird migration: Effect of water economy on flight duration</i>	\$3,000 6/91-5/92
M.H. Bernstein	<i>Introduction to Experimental Physiology - National Science Foundation</i>	\$82,929 8/90-8/93

Ron K. Bhada

Waste-management Education and Research Consortium
Engineering
Box 30001 Dept. WERC
Phone 646-1510 FAX 646-4149 E-Mail

Interests power cycles, waste management, pulp and paper, pollution control

Publications

- Bhada, R.K. 1993. Orphan wastes solution. *Annual HazWaste Conference*. Albuquerque, NM.
- Bhada, R.K. 1993. An international has materials initiative for the border. *International Safety Systems Conf. Proceedings*. Washington, DC.
- Bhada, R.K. 1993. Environmental design in chemical engineering education. *Aiche National Annual Meeting*. St. Louis, MO.
- Bhada, R.K. 1992. Innovative use of in-situ vitrification. *Aiche National Meeting*. Miami, FL.
- Bhada, R.K. 1992. Mathematical Models and Experimental Studies of Two Phase Flow Correlations Using Different Measurements. Amer. Assoc. for Advancement of Science, Southwestern and Rocky Mtn Div., 68th Ann. Mtg, May 17-21, Tucson, AZ.
- Bhada, R.K. 1992. The missing rung: Teaching management concepts to engineers. *Tech Mgmt*. Auerbach Publications, pp. 127-132.
- Bhada, R.K., R.B. Jacquez, D. Kauffman, and J.D. Morgan. 1992. Let's move towards multi-disciplinary multi-organizational education. *Proc. ASEE Ann. Conf.* Toledo, OH, pp. 1667-1671.
- Bhada, R.K. 1992. Collaborative education by universities and national laboratories. Amer. Chem. Soc. Rocky Mtn Reg. Mtg, Albuquerque, NM, Paper 42, p. 26.
- Bhada, R.K. 1992. Economic Development Via Education. New Mexico Gov. Env. Conf., Albuquerque, NM.
- Bhada, R.K. 1992. University-industry-government consortia for environmental studies. DOE HazMat Conf., Las Vegas, NM, p. 3.
- Bhada, R.K. 1992. WERC Annual Report 1991-1992. NMSU Rpt to the US Dept. of Energy.
- Bhada, R.K. 1992. The Carlsbad Environmental Monitoring and Research Center. *Proc. Waste Mgmt '92*. Tucson, AZ, pp. 395-397.
- Bhada, R.K. and J.D. Morgan. 1991. Achievements of a multidisciplinary education and research consortium. *Waste Mgmt '91 Proc.* Tucson, AZ, pp. 413-418.
- Bhada, R.K., J.D. Morgan and J. Townsend. 1991. A consortium for environmental education and research. *Env. Restoration 1991 Conf. Proc.* Richland, WA, Paper 28.
- Bhada, R.K. 1991. Environmentally conscious manufacturing symposium. ECM-91. Santa Fe, NM, pp. 61-69.
- Bhada, R.K. and D.J. Fingleton. 1991. A program for monitoring nuclear waste repository. *Internal Health Physical Society Conf. Proc.* Canada, Paper 18.
- Bhada, R.K. and J.D. Morgan. 1991. Strategic planning for a university department. Abstract, Aiche Ann. Mtg. Los Angeles, CA. Paper No. 223e, p. 430.
- Bhada, R.K., A. Ghassemi, and T.J. Wheeler. 1991. Education enhancement by student organizations. Aiche Ann. Mtg. Los Angeles, CA, Paper No. 220e, p. 424.
- Bhada, R.K., R.B. Jacquez, J.D. Morgan and L.K. Matthews. 1990. A consortium to address multidisciplinary issues of waste management. *Chem. Eng. Educ. J.* 24:180-185.
- Creed, J. and R.K. Bhada. 1992. Grey area experimental design. *Proc. ASEE Ann. Conf.* Toledo, OH, pp. 287-291.
- Fingleton, D. and R.K. Bhada. 1992. Waste management and environmental remediation—An innovative approach. *Proc. 1992 Engineering and Technology Conf.* Puerto Rico, pp. 1192-1198.
- Ghassemi, A., R.K. Bhada, and J.D. Morgan. 1992. A National Environmental Design Contest and Capstone Course for Universities. *Proc. ASEE Ann. Conf.* Toledo, OH, pp. 1282-1285.
- Ghassemi, A., R.K. Bhada. 1992. A national environmental design contest for universities. *Proc. Waste Management '92*. Tucson, AZ, pp. 817-819.
- Ghassemi, A., R.K. Bhada, and J.D. Morgan. 1992. A national environmental design contest for universities. *Proc. 24th Industrial and Hazardous Waste Conf.* Morgantown, WV, pp. 89-98.
- Ghassemi, A., R.K. Bhada, and J.D. Morgan. 1992. A national environmental design contest. Amer. Assoc. for Advancement of Science, Southwestern and Rocky Mtn Div., 68th Ann. Mtg. May 17-21, Tucson, AZ.
- Ghassemi, A., R.K. Bhada, and J.D. Morgan. 1992. Inter-university Design Contest. NMSU Rpt.
- Jacquez, R.B. and R.K. Bhada. 1992. Educational programs in environmental management provided through the Waste-management Education and Research Consortium. *Spectrum '92*.

Research Support

R.K. Bhada and others	<i>Waste-Management Education and Research Consortium</i> - Department of Energy	\$5.5M/yr
R.K. Bhada R. Jacquez	<i>International Environmental Fellows Program</i> - Department of Energy	\$500,000/yr
R.K. Bhada D. Fingleton	<i>Carlsbad Environmental Monitoring and Research Center</i> - Department of Energy	\$3M/yr
R.K. Bhada S. Senken (NCC)	<i>A Solid Waste Management Program for Native Americans</i> - Department of Energy	\$600/yr
A. Ghassemi R.K. Bhada	<i>Water Harvesting Sealant Selection and Mechanical Application</i> - Westinghouse Corporation	\$50,000 9/93-5/94
S. Holbrook R.K. Bhada	<i>Academic Research in Actinide Separations Technology</i> - Los Alamos National Laboratory	\$28,484 4/93-4/94

Related Team Efforts

I am currently Director of the Waste-management Education and Research Consortium of New Mexico and Associate Dean of Engineering. This is a consortium sponsored by the Department of Energy, and includes New Mexico State University, the University of New Mexico, the New Mexico Institute of Mining & Technology, the Navajo Community College, along with Sandia National Lab and Los Alamos National Lab. The mission of this consortium is to advance the nation's resources that can address issues relative to the management of our environment. This includes education and research on all types of issues related to waste, including radioactive waste, hazardous waste, mixed wastes, and solid wastes. The effort originates from New Mexico, but actually covers a national level. Under this program, there are undergraduate, graduate and associate degree programs, together with scholarships. The educational program includes an Interactive Television Network, whereby eight courses are transmitted each semester throughout the nation from the three universities. In addition, there is a teleconference series conducted each year for professional development training. This teleconference series is projected to approximately 84 organizations in the United States and includes upward of 2000 participants.

In addition to the course type curriculum, the Consortium also conducts over 32 research projects at the leading edge of technology. Although these projects will result in new discoveries, the main purpose of the projects is to provide training to faculty and students. The results are factored into the course work.

A major outreach activity is the International University Design Contest that WERC conducts annually. University teams from throughout US and Mexico compete in an environmental design solution including a report and concept demonstration at the NMSU campus. Twenty-five universities from throughout the US competed in 1994.

WERC also includes four laboratories, with one laboratory under the responsibility of each of the academic institutions of the Consortium. Among these laboratories, WERC has the capability of taking measurements and characterizing any type of waste. The laboratory at NMSU also performs drinking water analysis under a contract to the New Mexico Environmental Department.

The program has recently expanded into new areas, such as a completely independent organization at Carlsbad, responsible for obtaining data which can be used to evaluate the safety of the Carlsbad environment, as transuranic waste is placed in the WIPP. A new project called the International Environmental Fellows Program began in 1992 for the purpose of training emerging leaders from government and industry.

Special Facilities and Holdings

Facilities: Waste-management Education and Research Consortium includes the Soil, Water, Air Testing Laboratory in the College of Agriculture

Equipment: see description of SWAT Lab

Bibliographies: Waste-management Education and Research Consortium maintains a library of environmental literature

James Botsford, Jr.

Biology

Arts and Sciences

Box 30001 Dept. 3AF Foster Hall 301

Phone 646-3726 FAX 646-5665 E-Mail

Interests microbial physiology, soil microflora in soils amended with sewage sludge, molecular biology

Publications

Alvarez, M., J.L. Hanners, J. Botsford, and P. Unkefer. 1991. Enzymes Catalyzing Transformation of 2,4,6, Trinitro Toluene. Abstract 18, Amer. Soc. Microbiology Nat'l Conv., Dallas, TX.

Botsford, J.L. and J.G. Harman. 1992. Cyclic AMP in procaryotes. *Microbiol. Reviews*. 56:100-122.

Botsford, J. 1990. Osmoregulation in rhizobium meliloti: Production of flutamic acid in response to osmotic stress. *Appl. Environ. Microbiol.* 56:488-494.

Botsford, J. 1990. Analysis of protein expression in response to osmotic stress in escherichia coli. *FEMS Microbiol. Lett.* 72:355-360.

Gonzales, R., J.L. Botsford, and T.A. Lewis. 1990. Osmoregulation in rhizobium meliloti: Characterization of enzymes involved in glutamate synthesis. *Can. J. Microbiol.* 36:469-474.

Lewis, T.A., R. Gonzales, and J.L. Botsford. 1990. Rhizobium meliloti glutamate synthase: Cloning and initial characterization. *J. Bacteriol.* 172:2413-2420.

Research Support

J. Botsford	<i>Osmoregulation in Rhizobium Meliloti</i> - Pending USDA support; proposal	\$223,000
J. Hernandez	also will be submitted to the National Science Foundation	PENDING
J. Botsford	<i>Effect of Gelling Agents Used in Bioremediation on Soil Microflora</i> - WERC	\$69,910 3 yrs
J. Botsford I. Pepper (U of A)	<i>Characterization of Soil Microflora in Soils Amended with Sewage Sludge</i> - Southwest Consortium for Plant Genetics and Water Use	
J. Botsford P. Unkefer (Los Alamos Nat'l Lab)	<i>Isolation and Characterization of Bacteria Capable of Degrading TNT</i> - Department of Energy	
J. Botsford	<i>Molecular Biology of Osmoregulation</i> - NIH/MBRS (encourages ethnic minorities to enter biomedical science careers)	\$13,000/yr
J. Botsford	<i>Effect of Irradiated Sewage Sludge on Microbial Populations</i> - NM Water Resources Research Institute (proposal submitted)	\$25,000 7/94-6/95

Related Team Efforts

Research with Dr. John Hernandez is supported by WERC, a regional consortium of universities and laboratories funded by DOE.

Research with Dr. Ian Pepper of Univ. of Ariz. has been supported by the Southwest Consortium for Plant Genetics and Water Use. This is a regional effort.

The work with Dr. Unkefer, LANL, is part of a national effort by DOE to get their facilities cleaned up.

Stuart C. Brown

English

Arts and Sciences

Box 30001 Dept. 3E English 120

Phone 646-3931 FAX 646-7725 E-Mail sbrown@nmsu.edu

Interests rhetoric and professional communication, technical, scientific and business communication, communication ethics, environmental rhetoric

PublicationsBrown, S.C. and C. Herndl. *Rhetoric and the Environment: Selected Essays*. Univ. of Wisconsin Press. (In press).Brown, S.C. and T. Enos. 1994. *Professing the New Rhetorics: A Sourcebook*. Blair Press.Brown, S.C. and T. Enos. 1993. *Defining the New Rhetorics: Essays on Twentieth-Century Rhetoric*. Sage Publications.Brown, S.C., D. Roen and R. Mittan. 1990. *Becoming Expert: Writing and Learning In the Disciplines*. Kendall/Hunt, Dubuque, IA.

Richard Cabe

Economics

Business Administration and Economics

Box 30001 Dept. 3CQ

Phone 646-5909 FAX 646-1915 E-Mail

Interests environmental policy, agricultural policy

Research Support

R. Cabe	<i>Evaluating Impacts of Environmental and Agricultural Policies on the US - Iowa State University</i>	\$42,196 8/90-9/92
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R. Cabe	<i>A Framework for the Measurement of Offsite Damage Costs of Agricultural Soil Erosion - US Department of Agriculture</i>	\$15,000 10/93-9/94
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Foreign Experience

Cabe presented a paper entitled "Telecommunications Services Made of Building Blocks" at the Western Economic Association International Meeting held in Vancouver, BC in June 1994.

Fernando Cadena-C

Civil, Agricultural, and Geological Engineering

Box 30001 Dept. 3CE Engineering Complex II 220

Phone 646-3023 FAX 646-6049 E-Mail

Interests environmental engineering, hazardous waste management, waste minimization, development of environmental engineering science instrumentation, software development for environmental applications, physico-chemical treatment of water and wastewater

PublicationsBeach, M.I., R.B. Jacquez, F. Cadena and A. Shah. 1991. A computerized respirometric method for determining inhibition potential. *Proc. of the 45th Annual Purdue in Waste Conf.* pp. 487-489.Cadena, F., E. Cazares and R.W. Peters. 1992. Low-temperature regeneration of tailored soils for the removal of single-ring aromatic compounds. *Proc. of the 46th Annual Purdue in Waste Conf.* (In press).Cadena, F., I. Santiago and M.I. Beach. 1992. Modification of aerobic respirometer to assess biodegradability and toxicity of compounds in anaerobic processes. *Proc. of the 46th Annual Purdue in Waste Conference.* (In press).

- Cadena, F. and R.S. Bowman. 1992. Treatment of waters contaminated with BTX and heavy metals using tailored zeolites. *Radioactive Waste Mgmt and the Nuclear Fuel Cycle J.* (In press).
- Cadena, F., G. Rico and J. Beasley. 1991. Use of a PC game control adapter as a data acquisition system. Application to temperature measurement. *Computers in Education Division of ASEE (COED)*. 1:4:41-45.
- Cadena, F., R. Rizvi and R.W. Peters. 1990. Feasibility studies for the removal of heavy metals from solution using tailored bentonite. *Proc. of the 22nd Mid-Atlantic in Waste Conf.* pp. 77-94.
- Cadena, F., R. Garcia and R.W. Peters. 1990. Adsorption of benzene from aqueous solutions by bentonite treated with quaternary amines. *Environ. Progress*. 4:4:245-253.
- Cadena, F. 1990. *Regenerative Properties of Tailored Soils*. New Mexico Water Resources Research Institute Technical Completion Report No. 254, NMSU, Las Cruces, NM.
- Gao, F., F. Cadena and R.W. Peters. 1991. Use of tailored zeolites for removal of benzene, toluene and xylene from water. *Proc. of the 45th Annual Purdue in Waste Conf.* pp. 509-516.
- Hanson, A.T. and F. Cadena. 1990. Use of personal computers as an integrating strip chart recorder in the environmental engineering laboratory. *Computers in Education Division of ASEE (COED)*. 10:4:79-82.
- Janks, J.S. and F. Cadena. 1991. Identification and properties of modified zeolites for the removal of benzene, toluene, and xylene from aqueous solutions. *Proc. of the 66th Annual Technical Conference and Exhibitions of the Society of Petroleum Engineers*. SPE 22833:153-167.
- Martin, F.D., W.S. Weiss, F. Cadena, P.V. Worland, L. Scott, B. Erdal and C. Grigsby. 1992. Treatment of oilfield produced water for improved waste management. *Radioactive Waste Mgmt and the Nuclear Fuel Cycle J.* (In press).
- Peters, R.W., C.A. Wentz and F. Cadena. 1990. The university role in hazardous waste management: Faculty publications, teaching and research. *Proc. of the 22nd Mid-Atlantic in Waste Conf.* pp. 718-740.

Research Support

F. Cadena-C G.A. Eiceman	<i>Adsorption Behavior of Tailored Smectites</i> - National Science Foundation	\$292,000
F. Cadena-C N. Khandan	<i>Modeling Joint Effects of Mixtures of Chemicals</i> - US Air Force	\$323,000
F. Cadena-C R.S. Bowman NMTech	<i>Treatment of Water Contaminated with BTX</i> - WERC	\$103,000
F. Cadena-C	<i>Acquisition of Atomic Absorption Spectrophotometer</i> - Department of Energy	\$14,725 9/90-9/91
F. Cadena-C	<i>Simultaneous Removal of Anionic, Cationic, and Neutral Hazardous Pollutants from Aqueous Solutions</i> - DOE/WERC	\$3,601 5/93-5/94
F. Cadena-C	<i>Arsenate Precipitation by the Ferrous-acid-oxidation Method for the Removal of Arsenic from Water</i> - NM Water Resources Research Institute (proposal submitted)	\$25,000 7/94-6/95

Foreign Experience

Cadena-C received B.S. in Civil Engineering from the Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico. Languages include English, Spanish and Portuguese.

Related Team Efforts

Waste-management Education and Research Consortium (statewide); Los Alamos National Laboratory - development of environmental software (statewide, non-university); N-Con Corp. - development of respirometric devices for pollution monitoring and control (international-non-university); collaborated with Argonne National Laboratory on computer modeling hazardous waste transport in groundwater, environmental aspects of the Great Plains Coal Gasification Plant; environmental evaluation of transportation and processing of oil and natural gas, evaluation of treatment alternatives for the Otis Waste Water Treatment Plant; VOC inventory at DOD facilities; and removal of hazardous materials in groundwater; collaborated with City of Albuquerque, Liquid Wastes Division, for sulfides control in drinking water using hydrogen peroxide.

Special Facilities and Holdings

Facilities: Graduate Research Lab, Environmental Research Lab, Sanitary Engineering Research Lab
Equipment: 2 computerized respirometers, gas chromatograph, OTC analyzer, atomic absorption spectrophotometer, OEX analyzer

Michael Cain

Biology
Arts and Sciences
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Interests population ecology

Publications

Cain, M.L., S.W. Pacala, and J.A. Silander, Jr. 1991. Stochastic simulation of clonal growth in the tall goldenrod, *Solidago altissima*. *Oecologia*. 88:477-485.

Research Support

M.L. Cain	<i>Demography and Microevolution in the Clonal Herb, Asarum canadense</i> - submitted to the National Science Foundation summer 1992	
M.L. Cain K. Skaggs	<i>Demography of the endangered narrow endemic, Oenothera organensis</i> - submitted fall 1992	
D. Howard M.L. Cain	<i>The Isolating Potential of a Post-insemination Barrier to Fertilization</i> - National Science Foundation (proposal submitted)	\$428,153 8/94-7/97

Special Facilities and Holdings

Equipment: NEXT workstation

Frank F. Carden

Electrical and Computer Engineering
Engineering
Box 30001 Dept. 3-0 Thomas Brown 305
Phone 646-3919 FAX 646-1435 E-Mail

Interests communication theory and systems, telemetry

Publications

Carden, F. and S. Horan. 1991. Telemetry: An academic program. *The ITEA J. of Test and Evaluation*. 12:4-16-19.
Carden, F. and M. Ross. 1990. A quantized PSK 8-state decoder for spectrally efficient communication. *Proc. Int'l Telemetering Conf.* Las Vegas, NV. XXVI:489-496.
Carden, F. 1990. Spectrally Efficient Communications Systems. Semi-annual report to NASA for Center for Space Telemetering and Telecommunications Systems funding.

Research Support

F. Carden W. Osborne S. Horan	<i>Center for Space Telemetering and Telecommunication Systems</i> - NASA/Goddard Space Flight Center	\$3,161,076 2/92-1/95
F. Carden	<i>Coherent Communication Technology Material Development for Course Presentation</i> - Computer Sciences Corporation	\$9,750 6/93-7/93

Special Facilities and Holdings

Facilities: Telemetering and Communication Research Lab

Equipment: Communication System Test Bed, testing capability for telemetering system transmitting sensor data

Manuel Cardenas

Experimental Statistics

Agriculture and Home Economics

Box 30003 Dept. 3130 Gerald Thomas 128

Phone 646-2936 FAX 646-5975 E-Mail

Interests survey and biological sampling, general consulting, agricultural statistics

Publications

Boutouba, A., J.L. Holechek, M.L. Gaylean, G. Nunez-Hernandez, J.D. Wallace, and M. Cardenas. Influence of two native shrubs on goat nutritional status. (In press).

Cardenas, M. 1990. A review of the books "A Manual of Crop Experimentation" by Pearce, Clarke, Dyke and Kompson, and "Comparative Experiments with Field Crops", second edition by Dyke. *J. of Official Statistics*. Sweden. 5:3:308-309.

Rubio, H.O., M.K. Wood, M. Cardenas and B.A. Buchanan. 1990. Seeding emergence and root elongation of four grass species and evaporation from bare soil as affected by polyacrylamide. *J. of Arid Environ.* 18:33-41.

Tembo, A., J.L. Holechek, R. Valdez, J.D. Wallace, G. Nunez-Hernandez and M. Cardenas. Influence of native shrubs on nutritional status of goats: Fecal indicators. *J. Range Mgmt.* (Accepted pending revision).

Valdez, R. and M. Cardenas. Distributive mating behavior by subadult Armenian wild sheep in Iran. (In press).

Research Support

M. Cardenas *Establishing Data Bases and Analytical Systems for Economic Decision* \$32,400

W. Harper *Making in Agriculture - USDA/OICD*

J. Diemer

D.C. Hall

P. Biemer

M. Cardenas *Study on Hispanic Wildlife Sciences Majors - NMSU Minority Recruitment* \$2,000

R. Valdez *and Retention Committee*

D. Bustamante

M. Cardenas *Response Bias in Agricultural Survey Data 1990 - NASS* \$30,000

P. Biemer

M. Cardenas *Strigid Ecology in Mexico's Fragmented Forests - Submitted to the World* \$58,234

B. Figueroa *Wildlife Fund*

P.J. Zwank

R. Valdez

D.J. Howard

W.J. Boecklen

Foreign Experience

Taught statistics in Spanish at Universidad Nacional, Tegucigalpa, Honduras and a course in biological sampling at the University of Chihuahua, Mexico. Consulting through USAID: evaluation of agricultural survey statistical practices in Bolivia, Chile, Paraguay and Peru; evaluation of a study on water placement for cattle for the Univ. of Chihuahua; OICD supported cooperation activity in Ciudad Obregon, Mexico on assessing cotton host plant resistance.

Related Team Efforts

Member, Energy Committee, College of Agriculture and Home Economics, 1980

Lowell B. Catlett

Agricultural Economics and Agricultural Business
Agriculture and Home Economics
Box 30003 Dept. 3169
Phone 646-2504 FAX 646-3522 E-Mail

Interests price risk management, natural resources

Publications

Catlett, L.B. and B. Newcomb. 1992. Effects of production level estimates on hedging performance. *J. Amer. Soc. Farm Managers and Rural Appraisers*. 56:1:27-30.

Research Support

L.B. Catlett	<i>Experiments in price risk management: Cross hedging NM natural gas - NM Energy, Minerals and Natural Resources Department</i>	\$3,066 5/90-6/90
L.B. Catlett	<i>Non-Price Trade Barriers in New Mexico-Mexico Cotton Trading - US Department of Agriculture</i>	\$8,000 8/92-3/94

Richard A. Cole

Fishery and Wildlife Sciences
Agriculture and Home Economics
Box 30003 Dept. 4901 Knox Hall 132
Phone 646-1346 FAX 646-5975 E-Mail

Interests aquatics, renewable resource management, ecology, fish management, computer models, wildlife, watershed processes, public opinion

Publications

Bolton, S.M., T.J. Ward, and R.A. Cole. 1991. Sediment-related transport of nutrients from southwestern watersheds. *Journal of Irrigation and Drainage*. 117:5:736-747.

Cole, R.A., R.A. Deitner, R. Neumann, and M. Hatch. 1994. *A Comparison of Telephone, Mail and Creel Survey Results for Angler Success and Time Spent Fishing in Six New Mexico Lakes*. NM Water Resources Research Institute Technical Completion Report No. 283, Las Cruces, NM.

Cole, R.A. and F.A. Ward. 1994. Optimum fishery management policy: Angler opportunity versus angler benefit. *North American Journal of Fishery Management*. 14:22-33.

Cole, R.A., F.A. Ward, T.J. Ward, R.A. Deitner, S. Bolton, and J. Fiore. 1993. *Analysis of Central Arizona Angler Opportunity and Benefits Gained by Installing Artificial Habitat in Saquaro Lake, Based on Adaptation of the Comprehensive Management Planning Model, RIOFISH*. NM Water Resources Research Institute Technical Completion Report No. 280, Las Cruces, NM.

Cole, R.A. 1993. *Planning and Integrated Resource Management in the New Mexico Department of Game and Fish*. Completion report to NM Dept. of Game and Fish, Contract No. 80-516-72, Santa Fe, NM.

Cole, R., R. Deitner, R. Tafanelli, and G. Desmare. 1993. *Data Acquisition for Refining RIOFISH*. Final report, Federal Aid Project F-53-14, NM Dept. of Game and Fish, Santa Fe, NM.

Cole, R., R. Deitner, and E. Jaquez. 1993. *Threadfin Shad Introductions*. Final report, Federal Aid Project F-22-R-3, Study No. 110, NM Dept. of Game and Fish, Santa Fe, NM.

Cole, R., R. Deitner, R. Tafanelli, G. Desmare, E. Jaquez, and G. Maracchini. 1993. *Stock and Grow Fisheries Evaluation*. Final report, Federal Aid Project F-22-R-3, Study No. 109, NM Dept. of Game and Fish, Santa Fe, NM.

Cole, R., R. Deitner, R. Tafanelli, G. Desmare, G. Maracchini, and M. McInnis. 1993. *Fish Introduction in New Waters*. Final report, Federal Aid Project F-22-R-3, Study No. 108, NM Dept. of Game and Fish, Santa Fe, NM.

Cole, R., R. Deitner, R. Tafanelli, G. Desmare, R. Akroyd, G. Maracchini, E. Jaquez, and M. McInnis. 1993. *Water Redistribution*. Final report, Federal Aid Project F-22-R-3, Study No. 107, NM Dept. of Game and Fish, Santa Fe, NM.

Cole, R., R. Deitner, R. Tafanelli, G. Desmare, G. Maracchini, and R. Akroyd. 1993. *Aquatic Vegetation Management*. Study No. 106, NM Dept. of Game and Fish, Santa Fe, NM.

- Cole, R., R. Deitner, R. Tafanelli, G. Desmare, E. Jaquez, G. Maracchini, and R. Akroyd. 1993. Water Quality Management Study No. 105, NM Dept. of Game and Fish, Santa Fe, NM.
- Cole, R., R. Deitner, G. Maracchini, and R. Akroyd. 1993. Quality Trout Water Evaluation. Study No. 104, NM Dept. of Game and Fish, Santa Fe, NM.
- Cole, R., R. Deitner, F. Ward, and M. Hatch. 1993. Telephone Survey. Performance report, Federal Aid Project F-22-R-32, Study No. 101, NM Dept. of Game and Fish, Santa Fe, NM.
- Cole, R., R. Deitner, F. Ward, J. Fiore, and S. Van Vactor. 1992. Forecasting Reservoir Fisheries. Final report, Federal Aid Project F-53-R-13, Study 601, NM Dept. of Game and Fish, Santa Fe, NM.
- Cole, R., R. Deitner, S. Bolton, F. Ward, J. Fiore, and T. Ward. 1992. Completion of RIOFISH Structure. Final report, Federal Aid Project F-53-R-13, Study 801, NM Dept. of Game and Fish, Math Appendix, Santa Fe, NM.
- Cole, R.A. 1992. A review of "The Uses of Ecology: Lake Washington and Beyond" by W.T. Edmonson. *Fisheries*. 17:56.
- Cole, R.A. and F.A. Ward. 1991. Recreational policies, angler opportunity and angler benefit. *Warmwater Fisheries Symposium I*, Scottsdale, AZ. General Technical Report RM-207, Rocky Mountain Forest and Range Experiment Station, USDA Forest Service, Fort Collins, CO, pp. 373-379.
- Cole, R.A. and R.A. Deitner. 1991. Sensitivity analysis for fishery management of fluctuating reservoirs simulated by the planning model RIOFISH. *Warmwater Fisheries Symposium I*, Scottsdale, AZ. General Technical Report RM-207, Rocky Mountain Forest and Range Experiment Station, USDA Forest Service, Fort Collins, CO, pp. 133-142.
- Cole, R.A., R.A. Deitner, R.J. Tafanelli, and G.A. Desmare. 1991. Habitat, fish community and stocking effects on channel catfish stock density, growth, and harvest in New Mexico warmwater reservoirs. *Warmwater Fisheries Symposium I*, Scottsdale, AZ. General Technical Report RM-207, Rocky Mountain Forest and Range Experiment Station, USDA Forest Service, Fort Collins, CO, pp. 79-91.
- Cole, R.A. 1991. Aquatic habitat and critters in a dry state. *Proceedings of the 35th Annual New Mexico Water Conference, Toward a Common Goal: Forging Water Quality Partnerships*. NM Water Resources Research Institute Report No. 257, Las Cruces, NM, pp. 91-101.
- Cole, R.A., T.J. Ward, F.A. Ward, R.A. Deitner, S.M. Bolton, and K. Green-Hammond. 1990. *RIOFISH, a Fishery Management Planning Model for New Mexico Reservoirs*. NM Water Resources Research Institute Technical Completion Report No. 252, Las Cruces, NM.
- Green-Hammond, K., R.A. Cole, F.A. Ward, T.J. Ward, S.M. Bolton, R.A. Deitner, and J. Fiore. 1990. *User's Guide for RIOFISH—A Fishery Management Model for Large New Mexico Reservoirs*. NM Water Resources Research Institute Technical Completion Report No. 253, Las Cruces, NM.
- Ward, T.J., R.A. Cole, S.M. Bolton, F.A. Ward, and K.A. Green-Hammond. 1992. RIOFISH: An interdisciplinary planning model for water and fishery management. *Computer Techniques in Environmental Studies IV*. Elsevier Applied Science, P. Zannetti (ed.), New York, NY, pp. 611-625.

Research Support

R.A. Cole T.J. Ward F.A. Ward	<i>RIOFISH Model Application, Verification and Improvement</i> - NM Department of Game and Fish	\$1,646,853 5/89-10/92
R.A. Cole T.J. Ward F.A. Ward	<i>Evaluating Procedures for Developing and Applying Policy Analytical Tools for Fish and Wildlife Management in New Mexico</i> - NM Department of Game and Fish	\$1,251,750 5/92-11/93
R.A. Cole F.A. Ward T.J. Ward	<i>Comprehensive Resource Planning and Research - RIOFISH</i> - NM Water Resources Research Institute	\$130,000 9/93-7/94
R.A. Cole F.A. Ward T.J. Ward	<i>Management Model of Watershed Condition, Water Resources, and Recreation Value</i> - USDA/Cooperative State Research Service (proposal submitted)	\$339,593 10/94-9/97

Foreign Experiences

Cole will present a paper entitled "Computer Models in Fisheries-2" in August at the American Fishery Society meeting in Halifax, Nova Scotia.

Related Team Efforts

Cole collaborates with interdisciplinary team of NMSU faculty on research for NM Department of Game and Fish.

Special Facilities and Holdings

Model: 132-site sport fishing management model incorporating lakes, streams, watershed process, ecological process, economic values and management tactics
Facilities: aquatic field facilities, boats, motors, nets, etc.
Equipment: several 286, 386, and 486 computers and compatibles; UNIX network server for model project
Bibliographies: abstract file on fisheries and aquatic sciences is in process of being accumulated for New Mexico and vicinity

Bobby J. Creel

Water Resources Research Institute
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Phone 646-4337 FAX 646-6418 E-Mail bcreel@wri.nmsu.edu

Interests water resources economics, pesticide management, computer applications, resource management, GIS

Publications

Bahr, T., B. Creel, C.T. Ortega Klett, and L. Blair (eds.). 1990. *New Mexico State Land Trust Assessment: 1990*. NM Water Resources Research Institute Report No. M23.
Creel, B.J. and M.J. Meyer. 1992. Pesticide Ground-Water Management Plan. NM Water Resources Research Institute and NMDA Final Rpt. Division of Agricultural Environmental Services, Pesticide Management Bureau.
Creel, B.J. 1990. Pesticides/Ground water: How it affects commercial agriculture. *Proceedings of the 24th Annual Western Pecan Growers Association Conference*. Las Cruces, NM. pp. 100-111.

Research Support

B.J. Creel	<i>Pesticide Contamination of Groundwater</i> - NM Department of Agriculture	\$22,937 1/90-9/90
B.J. Creel	<i>Agricultural Chemical Management</i> - NM Department of Agriculture	\$45,863 10/90-9/91
B.J. Creel	<i>New Mexico Pesticide Management</i> - NM Department of Agriculture	\$12,546 10/91-9/92
B.J. Creel J. P. King L. Blair M. Riley (EBID) A. Racelis (Dona Ana County)	<i>Regional Water Planning</i> - Interstate Stream Commission	\$80,000 7/92-6/93
B.J. Creel	<i>New Mexico Pesticide Management Plan - Phase IV</i> - NM Department of Agriculture	\$25,000 10/92-9/93
B.J. Creel	<i>New Mexico Pesticide Management Plan - Phase V</i> - NM Department of Agriculture	\$25,000 10/93-9/94

Related Team Efforts

Creel is part of a team effort with Dona Ana County, Elephant Butte Irrigation District, and the City of Las Cruces in a regional water resources planning project. Creel will coordinate public meetings, presentations and forums and administer the project.

Special Facilities and Holdings

Equipment: SUNstation Desktop SPAR10; CalComp 9500 Digitizer; HP-GL/2 DraftMaster RXplus
Software: ARC/INFO, ARCVIEW, ACAD

Robert J. Czerniak

Geography

Arts and Sciences

Box 30001 Dept. MAP Breland 129

Phone 646-2708 FAX 646-7430 E-Mail

Interests land use and transportation planning, urban geography**Publications**Czerniak, R.J. 1992. Toledo, Ohio: Alternative transportation and land use structures. *Proc. Inst. of Transportation Engr.*Czerniak, R.J. and J.W. Frazier. 1992. Transportation and land use planning in El Paso, Texas: A regional analysis. *Papers and Proc. of Appl. Geography Conf.***Research Support**

R.J. Czerniak	<i>Development of a series of computer generated maps for the Socorro Electric Cooperative - Socorro Electric Cooperative</i>	\$26,112 10/90-9/93
R.J. Czerniak	<i>Building a geographic information system for border crossings and US ports - US Department of Transportation</i>	\$25,000 2/93-4/93
R.J. Czerniak	<i>Intergovernmental Personnel Agreement - Federal Highway Administration (proposal submitted)</i>	\$17,521 5/94-8/94

Leroy A. Daugherty

Agronomy and Horticulture

Agriculture and Home Economics

Box 30003 Dept. 3Q Gerald Thomas 261

Phone 646-3406 FAX 646-6041 E-Mail ldaugher@nmsu.edu

Interests soil genesis, morphology and classification, geomorphology, remote sensing, forest and range soils**Publications**

Monger, H.C. and L.A. Daugherty. 1991. Pressure solution: Possible mechanism for silicate grain dissolution in a petrocalcic horizon. *Soil Sci. Soc. Am. J.* 55:6:1625-1629. (available from WRRRI 646-1195)

Monger, H.C. and L.A. Daugherty. 1991. Neoformation of palygorskite in a southern New Mexico aridisol. *Soil Sci. Soc. Am. J.* 55:6:1646-1650. (available from WRRRI 646-1195)

Monger, H.C., L.A. Daugherty, W.C. Lindemann, and C.M. Liddell. 1991. Microbial precipitation of pedogenic calcite. *Geology.* 19:997-1000. (available from WRRRI, 646-1195)

Monger, H.C., L.A. Daugherty, and L.H. Gile. 1991. A microscopic examination of pedogenic calcite in an aridisol of southern New Mexico. In Occurrence, Characteristics and Genesis of Carbonate, Gypsum, and Silica Accumulations in Soils. W.D. Nettleton (ed.). *Soil Sci. Soc. Am. Spec. Publ. 26*, Madison, WI.

Monger, H.C. and L.A. Daugherty. 1990. The involvement of microorganisms in calcite precipitation in a New Mexico Aridisol. *Agron. Abs.* 1990:300.

Nash, M. and L.A. Daugherty. 1990. Soil-landscape relationship in alluvium sediments in southern New Mexico. NM Ag. Exp. Stat. Bulletin Number 746.

Nash, M. L.A. Daugherty. 1990. Statistical comparison of soil map unit boundaries. *Soil Sci. Soc. Am. J.* 54:6:1677-1681.

Nash, J. L. A. Daugherty, L. Murry and J.G. Bosland. 1990. Estimation of the soil temperature at 50 cm depth: Comparison of models. *Agron. Abs.* 1990:229.

Research Support

L.A. Daugherty C. Monger Soil Conservation Service	<i>Soil Genesis, Morphology and Classification of New Mexico Soils - NM Agricultural Experiment Station</i>	\$9,700/yr
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Related Team Efforts

Western Regional Coordinating Committee on Soil Survey
Great Plain Agricultural Council Crops and Soils Committee

Charles A. Davis

Fishery and Wildlife Sciences
Agriculture and Home Economics
Box 30003 Dept. 4901 Knox Hall 132
Phone 646-1544 FAX 646-5975 E-Mail cdavis@nmsu.edu

Interests avian ecology, teaching and administration

Publications

Davis, C.A., J.Z. Riley, M. Ortiz, and M.J. Wisdom. 1992. Vegetative characteristics of successful and unsuccessful nests of lesser prairie chickens. *J. Wildl. Mgmt.* 56:2:383-387.

Research Support

C.A. Davis *Fish and Wildlife Studies - INT/Fish and Wildlife Service* \$77,353
9/90-9/95

Michael N. DeMers

Geography
Arts and Sciences
Box 30001 Dept. MAP Breland 105
Phone 646-3509 FAX 646-7430 E-Mail

Interests landscape ecology, geographic information systems, biogeography

Publications

- Boerner, R.E.J., M.N. DeMers, J.W. Simpson, F.J. Artigas, A. Silva and L.A. Berns. 1993. Land use inertia and dynamism on two contiguous Ohio landscapes. *Geographical Analysis*. (Submitted).
- Coffeen, S.L. and M.N. DeMers. 1993. GIS as a tool for discovery-based undergraduate geography courses. *Journal of Geography*. (Submitted).
- DeMers, M.N. 1995. *Geographic Information Systems Modeling in Biological Conservation*. For consideration by Taylor and Francis.
- DeMers, M.N. 1994. *Fundamental Concepts of Geographic Information Systems*. For consideration by John Wiley and Sons.
- DeMers, M.N. 1994. Requirements analysis for GIS LESA implementation. *Agricultural Land Evaluation and Site Assessment*. F. Steiner, J. Pease and R. Cophlin (eds.). Selected papers from the 1st National LESA Conference, March 26-28, Kansas City, MO. (In press).
- DeMers, M.N. (ed.). 1993. *GIS in Ecology: Selected Readings*. Taylor and Francis.
- DeMers, M.N. and W. Tang. 1993. Automating historical vegetation map field data. *Environmental Conservation*. (Submitted).
- DeMers, M.N., J.W. Simpson, R.E.J. Boerner, A. Silva, L.A. Berns, and F.J. Artigas. 1993. Fencerows, edges, and implications of changing connectivity: A prototype on two contiguous Ohio landscapes. *Conservation Biology*. (Submitted).
- DeMers, M.N. 1993. Roadside ditches as corridors for range expansion of the western harvester ant. *Landscape Ecology*. 8:2:93-102.
- DeMers, M.N. 1992. Data Dictionary for ARC/INFO Database: Vegetation of Southeastern Mount Desert Island, Maine. Ohio State University, Geographic Information Systems Laboratory Technical Report.
- DeMers, M.N. 1992. Resolution tolerance in an automated SCS forest land evaluation model. *Computers, Environment and Urban Systems*. 16:5:389-401.
- DeMers, M.N. 1991. Classification and purpose in automated vegetation maps. *Geographical Review*. 81:3:267-280.

Peplies, R.W., D. Kiel and M.N. DeMers. 1993. The TVA rural land classification system: A retrospective for GIS design. *The Professional Geographer*. (Submitted).

Research Support

M.N. DeMers	<i>Reclaiming Poland's Riverine Resources</i> - US Agency for International Development	\$149,998 1992-
M.N. DeMers	<i>Spatio-Temporal Analysis of Ohio Vegetation: A Prototype GIS for the Northern Virginia Military District</i> - Ohio State University	\$34,000 1990-
M.N. DeMers	<i>A GIS Model of Vegetation Change in Southeastern Mount Desert Island, Maine</i> - National Science Foundation (proposal submitted)	\$75,000
M.N. DeMers	<i>A Fuzzy Set Based Remote Sensing Approach to Delineating Changes in Coastal Wetlands Vegetation Conditions</i> - National Aeronautics and Space Administration (proposal submitted)	\$105,000
M.N. DeMers	<i>An Examination of Allopatry between Two Species of <u>Pogonomyrmex</u> Harvester Ants</i> - National Science Foundation and National Geographic Society (proposal submitted)	\$85,000

Special Facilities and Holdings

Facilities: Digital Mapping Laboratory
Datasets: Kuchler's 1953 Mt. Desert Island, ME, data in ARC/INFO format

Joel A. Diemer

Agricultural Economics and Agricultural Business
Agriculture and Home Economics
Box 30003 Dept. 3169
Phone 646-2825 FAX 646-3522 E-Mail

Interests natural resources, regional economics

Publications

Diemer, J.A., R.C. Alvarez, R. Kirksey, and B. Stewart. 1992. The Impacts of the Conservation Reserve Program on the New Mexico Economy. Report to the New Mexico Soil Conservation Service.

Research Support

J. Diemer	<i>Cuba, New Mexico Area Participatory Design Workshop</i> - USDA Forest Service	\$10,000 5/93-7/93
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Foreign Experience

Diemer will travel to Honduras in June 1994 to conduct a Designing and Managing Search Conference and Workshop.

Gary B. Donart

Animal and Range Sciences
Agriculture and Home Economics
Box 30003 Dept. 3-I Knox Hall 317
Phone 646-2518 FAX 646-5441 E-Mail gdonart@nmsu.edu

Interests rangeland growth, rangeland development, rangeland management, rangeland vegetation related to environmental stress, animal grazing

Publications

- Donart, G.B., N. Butt, G.M. Southward, and N. Mohammed. 1991. Effect of defoliation on harvested yield of buffel grass. *Annals of Arid Zone*. 30:323-329.
- Kiesling, H.E., P.B. Kloppenburg, G.B. Donart, and R.E. Kirksey, 1992. Animal performance of steers grazing cool- and warm-season perennial grasses. Abstract, Livestock Research Briefs and Cattle Growers Short Course, Las Cruces, NM, pp. 33-36.
- Parker, E.E., J.D. Wallace, M.K. Petersen, G.B. Donart, D. Gambill, and W.S. Ramsey. 1992. Effect of certain management manipulations on range cow production efficiency. Abstract, Livestock Research Briefs and Cattle Growers Short Course, p. 62.
- Pieper, R.D., R.F. Beck, R.P. Gibbens, and G.B. Donart. 1992. Species composition of woodland communities in the southwest. Ecology and management of oak and associated woodlands. U.S. Forest Serv. Gen. Tech. Rep. RM-218. *Proc. NM Conf.on Environment*. Albuquerque, NM, p. 4.

Research Support

- G.B. Donart *Range plants - Hatch*
- G. B. Donart *Range fertilization - Agricultural Experiment Station*
R. Kirksey
- H. Kiesling *Tucumcari grazing - Agricultural Experiment Station*
G.B. Donart
R. Kirksey
- R. Pieper *Grazing systems - Agricultural Experiment Station*
G.B. Donart
G. Parker
- R. Pieper *Fort Bliss - Department of the Army*
G.B. Donart
M.K. Wood
T. Jones
- R. Pieper *Sustainable agriculture - SARE/ACE*
G.B. Donart
J. Libbin
A. Torell
D. Baker

Special Facilities and Holdings:

Facilities: Corona Ranch, Corona and Tucumcari Science Centers

Keith W. Duncan

Cooperative Extension

Agriculture and Home Economics

Box 30001 Dept. 3AE Agricultural Science Center/Artesia

Phone 748-1229 FAX 748-1229 E-Mail

Interests brush management, weed management, range improvement, vegetation manipulation

Publications

- Duncan, K.W. and K.C. McDaniel. 1993. 1992 Summary of Range Brush Control Research Demonstration Trials in New Mexico. Range Improvement Task Force, NMSU Ag. Exp. Station, NMSU Coop. Ext. Service Rpt. 33.
- Duncan, K.W., S.D. Schemnitz, M. Suzuki, Z. Homesley and M. Cardenas. 1993. Evaluation of saltcedar management - Pecos River, New Mexico. *Proceedings 1993 Riparian Conference*, Albuquerque, NM. (In print).

- Duncan, K.W. 1993. New strategies for tamarix management in New Mexico. *Colorado Riparian Assoc. Proceedings Fourth Annual Convention*, Steamboat Springs, CO, pp. 81-94.
- Duncan, K.W. 1993. Saltcedar control with imazapyr. *WSWS 1993 Res. Prog. Rep.*, Tucson, AZ, p. V-1.
- Duncan, K.W. and K.C. McDaniel. 1992. Chemical Weed and Brush Control Guide for New Mexico Rangelands. NMSU Coop. Ext. Service, 400 B-17. (Revised).
- Duncan, K.W. and K.C. McDaniel. 1992. 1991 Summary of Range Brush Control Research Demonstration Trials in New Mexico. Range Improvement Task Force, NMSU Ag. Exp. Station, NMSU Coop. Ext. Service Rpt. 30.
- Duncan, K.W., T.D. Whitson and K.C. McDaniel. 1991. Chemical control of broom snakeweed. *Noxious Range Weeds*. Western Press, Chapter 22.
- McDaniel, K.C. and K.W. Duncan. 1993. Fall application of herbicides for mesquite control. *WSWS 1993 Res. Prog. Rep.* Tucson, AZ, p. I-62.

Research Support

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| S. Schemnitz | <i>Saltcedar Control by Aerial Application of Arsenal, Pecos River Valley, Artesia, NM: A Wildlife Research Study - Pecos River Native Riparian Restoration Organization</i> | \$40,000 |
| K.W. Duncan | | |
| M. Cardenas | | |
| | | |
| K.W. Duncan | <i>Pecos River Native Riparian Restoration Project - currently seeking funding</i> | |
| | | |
| K.W. Duncan | <i>Broom Snakeweed Research Project - federal and state funding</i> | |
| K. McDaniel | | |
| T. Sterling | | |
| S. Smith | | |
| D. Thompson | | |
| D. Richman | | |

Related Team Efforts

Pecos River Native Riparian Restoration Project

Clyde E. Eastman

Agricultural Economics and Agricultural Business
 Agriculture and Home Economics
 Box 30003 Dept. 3169 Gerald Thomas 390
 Phone 646-2704 FAX 646-3522 E-Mail

Interests rural sociology, social change and development, small farms, labor displacement, structure of agriculture, farm stress and community services, pollution abatement, solar adoption and willingness to reduce energy consumption, Hispanic communities, Indian

Publications

- Eastman, C. 1994. IRCA's Impacts in New Mexico. Chapter 6 in Philip Martin et al. *Immigration Reform and US Agriculture*. University of California Press: Davis, CA.
- Eastman, C. and R. Krannich. 1992. Community change and persistence: The case of El Cerrito, New Mexico. *Proc. Rural Sociolog. Soc.* State College, PA.
- Eastman, C. 1992. Out of the Shadows: The Status of Legalizing Aliens in New Mexico. *Ag. Exp. Sta. Res. Rep.* 661.
- Eastman, C. 1991. Impacts of the Immigration Reform and Control Act of 1986 on New Mexico agriculture. *J. of Borderlands Studies*. 6:2:105-128.
- Eastman, C. 1991. Community land grants: The legacy. *Soc. Sci. J.* 28:1:101-117.
- Eastman, C. 1990. Gambia usufruct tenure: Help or hindrance to agricultural production? *Land Use Policy*. 7:1:27-40.
- Eastman, C. and J. Grieshop. 1989. Technology Development and Diffusion: Potatoes in Peru. Chapter 2 in *The Transformation of International Agricultural Research and Development*. J. Lin Compton (ed.). Lynne Rienner Publishers: Boulder, CO.
- Eastman, C., A. Fattah Al Kadi, M. Loay Bibars, and W. Aldworth. 1988. Adoption of Grain Drills in the Jordan Highlands. Technical Report No. 1. Jordan Highlands Agricultural Development Project and National Center for Agricultural Research and Technology Transfer. Amman, Jordan.
- Eastman, C. and J.R. Gray. 1987. *Grazing Communities in New Mexico*. University of New Mexico Press: Albuquerque, NM.

Research Support

C. Eastman	<i>Water for Rural Economic Development - USDA/Cooperative State Research Service</i>	\$49,927
J. King		9/92-9/94

Foreign Experience

Extensive international agricultural development experience having served five long-term assignments: Amman, Jordan; Banjul, Gambia; Lima, Peru; and Ban Me Thout, Da Lat and Hung Loc, Vietnam. In these countries Eastman developed or upgraded research and extension capabilities in the ministries of agriculture and/or the agrarian universities.

Gary A. Eiceman

Chemistry and Biochemistry

Arts and Sciences

Box 30001 Dept. 3C

Phone 646-2146 FAX 646-6094 E-Mail geiceman@nmsu.edu

Interests ion mobility spectrometry, hazardous organic compounds: detection, movement and fate in air, water and soil, gas and liquid chromatography, mass spectrometry

Publications

Bell, S.E., W.C. Mead, G.A. Eiceman, and R.E. Ewing. 1993. Connectionist hyperprism neural network for the analysis of ion mobility spectra: An empirical evaluation. *Journal of Chemical Computers*. 33:609.

Clement, R.E., C.J. Koester, and G.A. Eiceman. 1993. Environmental analysis. *Analytical Chemistry*. 65:85R.

Eiceman, G.A., G.A. O'Connor and N.S. Urquhart. 1993. Logistic and economic principles in GC/MS use for plant uptake investigations. *Journal of Environmental Quality*. 22:1:167.

Eiceman, G.A., et al. 1993. Ion mobility spectrometry of hydrazines, monomethylhydrazine, and ammonia using 5-Nonanone reagent gas. *Anal. Chem.* 65:1696.

Harden, C.S., A.P. Snyder, and G.A. Eiceman. 1993. Determination of collision induced dissociation mechanisms and cross sections in organophosphorus compounds by atmospheric pressure ionization tandem mass spectrometry. *Journal of Organic Mass Spec.* 28:585.

Karpas, Z., G.A. Eiceman, C.S. Harden, and R.E. Ewing. 1993. On the structure of water alcohol and ammonia-alcohol protonated clusters. *Journal of American Society of Mass Spectrometry*. 4:507.

Karpas, Z., Y.-F. Wang, and G.A. Eiceman. 1993. Qualitative and quantitative response characteristics of a capillary gas chromatograph/ion mobility spectrometry to halogenated compounds. *Analytica Chim Acta*. 282:19.

Karpas, Z., G.A. Eiceman, R.G. Ewing, A. Algon, A. Avida, M. Friedman, A. Matmor, and O. Shahal. 1993. Ion distribution profiles in the drift region of an ion mobility spectrometer. *Int. J. Mass Spectrom. Ion Process.* 127:95.

Research Support

G.A. Eiceman	<i>Continuous Online Monitoring of Bacteria in Water and Wastewater Treatment Plants - National Science Foundation</i>	\$350,000
F. Cadena		2/93-1/96
G.B. Smith		

G.A. Eiceman	<i>Contaminant Mapping at Waste Sites under Advanced Field Analyzer Networks, Evaluation and Field Testing - Waste-management Education and Research Consortium</i>	\$60,000
		2/93-2/94

G.A. Eiceman	<i>Supplement to WERC Project Year 2 - Sandia National Laboratories</i>	\$30,000
		3/93-3/94

G.A. Eiceman	<i>Ion Mobility Spectrometry - GeoCenter (US Army, Edgewood Research Development Engineering Center)</i>	\$40,000
		9/93-8/94

John J. Ellington

Entomology, Plant Pathology, and Weed Science

Agriculture and Home Economics

Box 30003 Dept. 3BE

Phone 646-2037 FAX 646-5975 E-Mail EPP003@nmsuvm1.nmsu.edu

Interests entomology, biological control, plant resistance, field crop production, cotton, alfalfa, pecans**Publications**Ellington, J.J., C.G. Jackson, and J.W. Debolt. 1992. Lygus bugs, Lygus spp. (hemiptera: Miridae). *Arthropod Pest Case History*. University of California Press.Ellington, J.J., L.K. Etzel, K.S. Hagen, and D. Gonzalez. 1992. Lygus bugs, Lygus spp. (hemiptera: Miridae). *Arthropod Pest Case History*. University of California Press.Ellington, J.J. 1991. Lygus bugs, Lygus spp. (hemiptera: Miridae). *Proc. Western Region W-84 Ann. Mtg*, Las Cruces, NM.Ellington, J.J., T. Carrillo, and J.B. Jordan. 1991. Pectinophora gossypiella (Saunders). *Proc. Int'l Cotton Pest Work Committee*, Mazatlan, Mexico.**Research Support**

J.J. Ellington	<i>Control of pecan nut casebearer in the El Paso and Mesilla valleys - Stahmann Farms</i>	\$30,000 9/91-9/92
J.J. Ellington	<i>Cotton Integrated Pest Management with Emphasis on Biological Control of Pink Bollworm - USDA/Office of International Cooperation and Development</i>	\$981,000 8/90-4/94
J.J. Ellington	<i>Entomologically Sustainable Cotton—Biocontrol, Monitoring and Modeling - International Arid Lands Consortium (proposal submitted)</i>	\$75,000 1/94-12/94

Foreign Experience

Ellington will be working with two visiting scientists from Egypt for eleven months (beginning in May 1993) on a computer program for cotton physiology and insect modeling utilizing texcim modeling software. Ellington traveled to Beijing, China in June 1992 to attend the 19th International Congress of Entomology.

Paul R. Finch

Industrial Engineering

Engineering

Box 30001 Dept. 4230 Jett Hall 159

Phone 646-2950 FAX 646-2976 E-Mail

Interests computer modeling, simulation**Research Support**

P.R. Finch	<i>Coordinate Measuring Machine Calibration - Sandia National Laboratories</i>	\$12,000
P.R. Finch	<i>Manufacturing and Product Distribution Game (educational game) - unfunded</i>	
P.R. Finch	<i>Testing and calibration intervals for coordinate measuring machines (CMM) - Sandia National Laboratories</i>	\$15,600 1/92-10/92

Robert E. Foster

Southwest Technology Development Institute

Engineering

Box 30001 Dept. 3SOL Engineering Complex I #115

Phone 646-3948 FAX 646-2960 E-Mail swtdi@helen.nmsu.edu

Interests Latin American renewable energy development, photovoltaic systems, solar thermal systems, evaporative cooling systems, building energy systems and modeling, geothermal energy

Publications

- Foster, R.E. 1993. Evaporative air conditioning and reductions in chlorofluorocarbon and energy consumption. *Ozone-Safe Cooling Conference, Greenpeace*. October 18-19, Washington, D.C.
- Foster, R.E. 1993. An overview of evaporative air-conditioning technologies and contributions towards reducing CFC and energy usage. *1993 Non-Fluorocarbon Refrigeration and Air Conditioning Technology Workshop*. Oak Ridge National Laboratories/Department of Energy. June 23, Breckenridge, CO.
- Foster, R.E. and R. Pate. 1992. Extendiendo el uso de la generacion electrica usando tecnologias energeticas solares y eolicas en las Americas. *Actas, Septimo Seminario Nacional de Energia Solar y Eolica*. November 25-27. Valparaiso, Chile.
- Foster, R.E., W.H. Zachritz, R. Schoenmackers, R.L. Polka, and C.B. Reel. 1991. Potential photovoltaic powered greenhouse applications for developing regions. *1991 Solar World Congress: Proceedings of the Biennial Congress of the International Solar Energy Society*. August 19-13, Pergamon Press: Denver, CO. 1:1:225-230.
- Foster, R.E. 1991. Enfriamiento evaporativo y aplicaciones para America Latina. *Procedimientos del 1 Congreso Iberoamericano de Aire Acondicionado y Refrigeracion*, Cartagena, Colombia. pp. 57-60.
- Foster, R.E. 1991. Evaporative air-conditioning technologies and contributions to reducing greenhouse gases. *Proc. Asia-Pacific Conf. on CFC Issue and Greenhouse Effect*, Singapore. pp. 20-23.
- Foster, R.E. 1990. Geothermal resources for greenhouses. *Program of the 18th Annual Conference of the American Horticultural Therapy Association-Protecting Health and Habitat in the 90's*. August 5-7, Albuquerque, NM.
- Foster, R.E., G. McDonald and M. Heller Turietta. 1990. Phaseout of chlorofluorocarbon refrigerants and opportunities for evaporative cooling. *Proceedings of the 1990 United States National Committee of the International Institute of Refrigeration (USNC/IIR) Purdue Refrigeration Conference/ASHRAE-Purdue CFC Conference*. July 17-20, Purdue University, West Lafayette, IN. pp. 1-9.
- McDonald, G., M. Heller Turietta and R.E. Foster. 1990. Modeling evaporative cooling systems with DOE-2.1d. *ASHRAE Transactions*. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Atlanta, GA. 96:1:AT-90-18-2.

Research Support

R.E. Foster	<i>Programa de Cooperacion en Energia Renovable (PROCER)</i> - Sandia National Laboratories	\$100,000 FY94
R. Pate (Sandia Nat'l Labs)		
R.E. Foster S. Durand	<i>Support of Design Assistance Center International Activities</i> - Sandia National Laboratories	\$200,000 FY94
R.E. Foster	<i>Evaporative Cooling Institute</i> - Evaporative Cooling Institute	\$6,000 FY94

Foreign Experience

Foster is involved with international efforts to promote renewable resource technologies efforts and evaporative cooling technologies.

In June 1994 Foster conducted site visits of eight proposed solar and wind energy projects by Chihuahuan government agencies in the rural areas surrounding Camargo, Jimenez and Meoqui. He traveled in March 1993 with engineers from the Universidad de Sonora, Sandia Labs and the Mexican company CIEDAC to evaluate construction progress of a solar thermal electrical generating and ice-making plant under construction in Sonora.

Foster designed and installed a data acquisition system for monitoring performance of the solar/wind centralized hybrid electrical generating systems for the village of Xcalac in Quintana Roo, Mexico.

Foster along with Rudi Schoenmaker hosted government officials and engineers from China during March 1993. The Chinese were interested in collaborating on renewable energy development projects and were visiting various solar and wind energy installations in the US.

Foster and S. Durand traveled to Cuernavaca and Mexico City in Jan 1993, with staff of Sandia Natl Labs in support of the Programa de Cooperacion en Energia Renovable. They made plans for instrumenting solar and wind energy centralized hybrid electrical generating systems for two villages.

In October 1992, Foster received an Academic Specialist grant by USIA to review and assess the renewable energy program for six northern universities in Chile.

Foster helped organize and conducted a solar and wind water pumping workshop in Bolivia in late 1993. Along with Steven Durand, Foster recalibrated a data acquisition system for the village of Xcalak in Quintana Roo, Mexico. While in Guatemala in September 1993, Foster provided technical support to Guatemalan solar electrification efforts for Sandia National Laboratories.

Foster participated as a representative of Sandia National Laboratories as part of an energy efficiency and renewable energy training needs assessment team of the International Institute of Education and USAID in Mexico City. Foster also conducted technical field assessments of photovoltaic systems in the Dominican Republic as part of the World Bank team. He also traveled to Port-Au-Prince, Haiti in August 1993 and met with representatives of the Centre D'Energie Alternative to discuss proposals for future collaboration on solar energy projects.

Mexican PV Battery/Charge Controller Workshop, Colima, Mexico in 1993 for Sandia National Laboratories. Guatemala PV Battery/Charge Controller Workshop, Guatemala City, February 1994 for Sandia National Laboratories. Honduran Solar/Wind Water Pumping Workshop, Roatan, May 1994 for Sandia National Laboratories.

Foster traveled to Guatemala City in February 1994 to assist in conducting a photovoltaic battery and charge controller workshop for engineers and solar designers from throughout Central America. In March, Foster visited Chihuahua to discuss a renewable energy productive end-uses program. He will travel to Roatan, Honduras and Cancun, Mexico to conduct a Photovoltaic/Wind Water Pumping Workshop.

Related Team Efforts

Foster is involved with international efforts to promote renewable resource technologies and evaporative cooling technologies.

Special Facilities and Holdings

Facilities: Southwest Cooling Center field laboratory for evaporative cooling testing; Southwest Region Experiment Station for photovoltaic systems
Equipment: various instrumentation (temperature, pressure, velocity, etc.); DOS & MacIntosh PCs
Bibliographies: Evaporative Cooling Institute bibliography
Datasets: TMY data, International solar radiation data
Software: various PC software and DOE2.1d on mainframe

James L. Fowler

Agronomy and Horticulture

Agriculture and Home Economics

Box 30003 Dept. 3Q Gerald Thomas 289

Phone 646-4420 FAX 646-6041 E-Mail

Interests crop physiology, physiology of abiotic plant stresses, drought, salinity, temperature, crop - water relationships, water conservation

Publications

Asare, D.K., T.W. Sammis, H. Assadian, and J.L. Fowler. 1992. Evaluating three cotton simulation models under different irrigation regimes. *Agric. Water Management*. 22:391-407.

Bullock, D.G., M. Dugarte-Fernandez, J.L. Fowler, and K.J. Moore. 1991. Growth analysis of a sorghum X sudangrass hybrid under different irrigation amounts. *Biotronics*. 20:9-17.

Chan, J.L. and J.L. Fowler, 1992. Validation of relative water content for studying plant water relations in crambe. *Industrial Crops and Products*. 1:21-29.

Fowler, J.L. and R.C. Tinguely. 1993. Direct seeding of guayule as influenced by polyacrylamide soil conditioner, bed shape, and seed cover. *Industrial Crops and Products*. 2:13-21.

- Fowler, J.L. and R. Tinguely. 1993. Growth of direct seeded and transplanted guayule seedlings. *New Crops. Proc. Second National Symposium of New Crops*. J. Janick and J.E. Simon (eds.) October 6-9, Indianapolis, IN.
- Fowler, J.L., J.H. Hageman, K.J. Moore, M. Suzukida, H. Assadian, and M. Valenzuela. 1992. Forage quality of Russian thistle as influenced by salinity stress. *Journal of Range Management*. 45:559-563.
- Fowler, J.L. 1991. Interaction of salinity and temperature on the germination of crambe. *Agron. J.* 83:169-172.

Research Support

- J.L. Fowler *Development of Short Season Cotton Production Strategies for Reducing Inputs and Optimizing Yield and Quality - Hatch and State Experiment Station*
- J.L. Fowler *Unified Five-Year Guayule Breeding and Genetics Research Program - USDA/CSRS*
- J.L. Fowler *Agronomic Production of Lesquerella - USDA/CSRS*
- J.L. Fowler *Growth Regulator Studies on Cotton - Elf Atochem North America, Inc. and Rhone-Poulenc Ag Company*

Related Team Efforts

The Unified Five-Year Guayule Breeding and Genetics Research Program is a four-state (Arizona, California, New Mexico and Texas) effort to develop a domestic natural rubber industry for the US. Guayule is an arid lands plant native to southwestern (Big Bend) Texas and Northern Mexico which produces natural rubber almost identical in critical properties to that of Hevea. Guayule also produces a number of lower molecular weight polymers, collectively called resins, that are being developed as coatings (paints, etc.). The interesting property about these coatings is that they are spreadable at RT but contain no volatile solvents. The Polymer Lab at Southern Mississippi and researchers at Texas A&M and University of Arizona are working on the co-products research in a separate effort from that of the Breeding/Genetics Program.

Special Facilities and Holdings

- Facilities: greenhouse facilities for crop salinity tolerance studies; field research plot area dedicated to plant-water relationship studies with independent/self-contained irrigation well and distribution system
- Equipment: usual crop physiology/plant-water relationship study equipment

John M. Fowler

Agricultural Economics and Agricultural Business
 Agriculture and Home Economics
 Box 30003 Dept. 3169 Gerald Thomas 381
 Phone 646-2841 FAX 646-3522 E-Mail

Interests forestry and range economics, forage, fibre on pinyon-juniper woodlands, range livestock industry

Publications

- Fowler, J.M. and N. Bledsoe. 1992. Economic Evaluation of the Forage Fiber Response to Pinyon-Juniper Thinning. *Ag. Exp. Sta. Bull.* 753.
- Fowler, J.M. 1992. Competitive bid for public forage: McGregor Range example. Appendix A: Grazing Fee Review and Evaluation, Update of the 1986 Final Report. Dept. of Agriculture and Dept. of Interior.
- Fowler, J.M. and J. Hawkes. 1992. Level of dependency of beef cattle. Appendix A: Grazing Fee Review and Evaluation, Update of the 1986 Final Report. Dept. of Ag. and Dept. of Interior.
- Fowler, J.M. and J. Knight. 1992. Fee hunting enterprises on New Mexico ranches: Characteristics of an infant industry. *Proc. 2nd Int'l Wildlife Ranching Symposium*. Pretoria, South Africa.
- Fowler, J.M. and M. Fusco. 1992. Critique of grazing fee review and evaluation. Appendix A: Grazing Fee Review and Evaluation, Update of the 1986 Final Report. Dept. of Ag. and Dept. of Interior.
- Fowler, J.M. 1990. The art and science of being an effective expert witness on natural resource issues. *Rangelands*. 12:4:201-202.

Research Support

J.M. Fowler *Forage-Fibre Tradeoffs on Pinyon-Juniper Woodlands* - Bureau of Land Management and US Forest Service (David Rush)

J.M. Fowler *Economic Impacts of Range Livestock Industry* - Public Lands Council and Western Livestock Producers Alliance, National Cattlemen's Association

Foreign Experience

1st, 2nd and 3rd International Wildlife Ranching Symposium: Las Cruces, NM (1988); Edmonton, Alberta, Canada (1990); Pretoria, South Africa (1992)

Related Team Efforts

Coordinator - Range Improvement Task Force, 9 professionals with Experiment Station and Extension Service within the College of Agriculture and Home Economics

Special Facilities and Holdings

Facilities: four research plots: two on US Forest Service areas, one on Bureau of Land Management land and one on private land (woodland growth and seedling in-growth)

Jose Z. Garcia

Center for Latin American Studies
Box 30001 Dept. 3LAS Nason House 120
Phone 646-2842 FAX 646-6819 E-Mail jgarcia@nmsu.edu

Interests Latin America, international relations, border resource issues, armed forces in El Salvador, US-Mexico border policy

Publications

Garcia, J.Z. 1992. The Tanda System and Military Control in El Salvador. *El Salvador: Is There a Transition to Democracy?* J. Tulchin (ed.). Westview Press: Boulder, CO. pp. 56-73.

Garcia, J.Z. 1992. The armed forces and the peace process in El Salvador. *North-South*. 5:1:15-21.

Research Support

J.Z. Garcia	<i>Armed Forces in El Salvador</i> - Tinker, Mellon grants and New Mexico State University	\$20,000 over past 8 yrs
J.Z. Garcia	<i>Armed Forces and the Shining Path in Peru</i> - not currently funded	
J.Z. Garcia	<i>US-Mexico Border Policy: Agenda for the 1990s</i> - not currently funded	
J.Z. Garcia	<i>Consortium for Latin American studies</i> - University of New Mexico	\$60,891 5/91-8/93
J.Z. Garcia Y. Lapid	<i>WWNFF Paired Institutions Program</i> - Woodrow Wilson National Fellowship Foundation	\$50,000 8/93-7/96
J.Z. Garcia	<i>National Physical Science Consortium Recruitment Program</i> - National Physical Science Consortium	\$246,286 7/92-6/94
J.Z. Garcia	<i>National Resource Centers and Foreign Language and Area Studies Fellowships</i> - University of New Mexico	\$59,169 8/93-8/94
J.Z. Garcia	<i>Central America Peace Scholarship Program/Honduras Mayoral Candidates Program</i> - Academy for Educational Development (proposal submitted)	\$142,296 4/93-6/93

Foreign Experience

Garcia, at the invitation of Dr. Luis Berganza, President of the University of Asuncion, traveled to Paraguay in May 1993 to conduct seminars and workshops on issues related to democracy.

Garcia traveled to Yucatan, El Salvador and Panama in November 1992 to work on research on democratization.

Special Facilities and Holdings

Datasets: Nason House Latin America Library
LAI Latin America Data Base, at UNM
UNM-NMSU US-Mexico border database

Soumendra N. Ghosh

Economics

Business Administration and Economics

Box 30001 Dept. 3CQ Business Complex 342

Phone 646-2340 FAX 646-1915 E-Mail

Interests

resource economics, economic development, sustainable food production and natural resources, policy analysis for managing environmental pollution, efficiency and technology change, macroeconomic policies for managing foreign debt, sustainable food production and natural resource management in Sub-Saharan Africa, policy analysis for managing environmental pollution in the border region of US and Mexico

Publications

Ghosh, S.N. 1992. Water conservation in irrigated agriculture: A stochastic production frontier model. *Water Resources Research*. 28:2:305-312.

Ghosh, S.N. 1992. Revenue stabilizing tax rates over the business cycle: Implication for states. *Quarterly J. of Bus. and Econ.* Summer 1992.

Ghosh, S.N. 1991. Structural changes in the U.S. electric utility industry and the scarcity rent of coal. *Applied Econ.* 23:57-63.

Ghosh, S.N. 1991. A generalized production frontier approach for estimating the determinants of inefficiency in U.S. dairy farms. *J. of Business and Econ. Stats.* 9:3:279-286.

Ghosh, S.N. 1991. Determinants of risk perception and risk reduction behavior: The case of IV drug using population in Houston. Ann. Mtg. of the Southern Econ. Assoc. Nashville, TN.

Ghosh, S.N. 1991. Measuring efficiency in the presence of contract interlinkage: Evidence from rural India. Ann. Mtg. of the Southern Econ. Assoc., Nashville, TN.

Research Support

S.N. Ghosh	<i>Decision Support System for Analyzing Effectiveness of Alternative</i>	\$66,652
T. McGuckin	<i>Institutions for Environmental Policy Analysis - US EPA/SCERP</i>	

S.N. Ghosh and Center for International Programs	<i>Macroeconomic and Financial Policy Analysis Project - Submitted in</i> response to RFP No. The Gambia 92-103, USAID	\$1,793,511
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Foreign Experience

Ghosh is involved in an EPA-funded project on policy analysis for improved management of the environmental pollution along the border region of the US and Mexico. Prior to his academic career at NMSU, Ghosh served the United Nations Development Program as an Economic Statistician and was stationed in the Eastern Caribbean country Saint Vincent and the Grenadines. In India, Ghosh headed a team of twenty economists and statisticians working in rural development. His association with West Bengal Comprehensive Area Development Corporation for the years of 1978 through 1981 brought significant reputation to this pioneer agency in rural development not only in West Bengal but also in the entire subcontinent.

Ghosh presented papers entitled "Cross-Border Trade: Legal or Illegal: The Case of the Gambia in West Africa" and "Interest Rate or Exchange Rate: Which Axe to Grind?" at the Western Economic Association International Meeting held in Vancouver, BC in June 1994.

B.A. and M.A. in economics from Calcutta University.

Ghosh began a two-year assignment in The Gambia as an economist on a policy analysis project. He left Jan 1993.

Languages include English, Spanish (limited), Hindu, Bengali (Native), Nepali (limited), Urdu (limited).

Related Team Efforts

Ghosh currently is participating in Southwest Consortium on Environmental Research and Policy activities.

Special Facilities and Holdings

Equipment: special computers (such as Sun/Risk systems) for pollution database would be helpful
Bibliographies: complete bibliographical information, EPA on-line databases, if available would be beneficial
Datasets: environmental data set relating to the border region would be unique and helpful
Software: graphic characterization software would be helpful

Robert Gibbens

Animal and Range Sciences
Agriculture and Home Economics
Box 30003 Dept. 3JER Knox Hall 306
Phone 646-4842 FAX 646-5889 E-Mail

Interests range ecology, root systems of Chihuahuan Desert plants, livestock grazing and vegetation types, native and introduced grasses and major shrub species related to precipitation patterns, shrub reestablishment, water stress on plants

Publications

- Anderson, D.M., R.P. Gibbens, C.V. Hulet, K.M. Havstad, and L.W. Murray. 1990. Biological defoliation of tarbush. Livestock Research Briefs and Cattle Growers' Short Course. NMSU Ag. Exp. Stat. pp. 76-77.
- Barrow, J., K. Havstad, and R. Gibbens. 1991. Alternative ways to seed rangeland. Livestock and Research Briefs and Cattle Growers' Short Course. NMSU Ag. Exp. Stat.
- Barrow, J., K. Havstad, R. Gibbens, and P. Donaldson. 1990. Alternative methods of seeding native lands. *Agron. Abs.* 1990 annual meeting.. San Antonio, TX. p. 163.
- Gibbens, R.P. 1991. Some effects of precipitation patterns on mesa dropseed phenology. *J. Range Mgmt.* 44:1:86-90.
- Gibbens, R.P., D.D. Billheimer, K.M. Havstad, and C.H. Herbel, 1991. Creosotebush vegetation after 50 years of lagomorph exclusion. Abstract No. P63. 44th Ann. Mtg of the Soc. of Range Mgmt. Washington, DC.
- Gibbens, R.P. and K.M. Havstad. 1991. An ecological assessment of vegetation change on the Jornada Experimental Range and implications for livestock grazing in southern New Mexico. Livestock Research Briefs and Cattle Growers' Short Course. NMSU Ag. Exp. Stat. pp. 91-92.
- Gibbens, R.P., R.F. Beck and R. McNeely. 1990. Recent rates of mesquite (*Prosopis glandulosa* Torr.) establishment in the northern Chihuahuan Desert. Abstract No. 191. 43rd Ann. Mtg. of the Soc. for Range Mgmt. Reno, NV.
- Gibbens, R.P., R.F. Beck, and R. McNeely. 1990. Recent rates of mesquite (*Prosopis glandulosa* Torr.) establishment in the northern Chihuahuan Desert. Livestock Research Briefs and Cattle Growers' Short Course. NMSU Ag. Exp. Stat. pp. 70-71.
- Mason, J.B., R.P. Gibbens, and K.M. Havstad. 1991. GIS applications to rangeland research on the Jornada Experimental Range. Abstract No. P64. 44th Ann. Mtg. of the Soc. Range Mgmt. Washington, DC.
- Senock, R.S, J.R. Barrow, R.P. Gibbens, and C.H. Herbel. Ecophysiology of the polyploid shrub *Atriplex canescens* (Chenopodiaceae) growing in situ in the northern Chihuahuan Desert. *J. of Arid Environ.* (In press).
- Senock, R.S, J.R. Barrow R.P. Gibbens, and C.H. Herbel. 1990. Gas exchange and water relations of the polyploid shrub *Atriplex canescens* growing in the northern Chihuahuan Desert. Abstract No. 51. 43rd Ann. Mtg. of the Soc. for Range Mgmt. Reno, NV.

Research Support

R.P. Gibbins *Spatial and Temporal Variation of Energy Fluxes in Chihuahuan Desert*
W.A. Dugas *Ecosystems* - ongoing research, unfunded but proposal has been submitted
(Texas Ag. Exp. Station)

Special Facilities and Holdings

Facilities: Jornada Experimental Range contains 193,000 acres in northern Chihuahuan Desert; designated Biosphere Reserve and Ecological Reserve; site of many collaborative projects

Equipment: many types of heavy equipment; functional GIS software and computer; numerous long-term livestock enclosures
Datasets: long-term rainfall, plant production and stocking records, quadrat records 1915-1979

Thomas H. Giordano

Geological Sciences
Arts and Sciences
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Phone 646-2511 FAX 646-6096 E-Mail

Interest geochemistry, ore deposits, geochemistry of aqueous systems, water-rock interactions, thermodynamics of aqueous solutions, ore deposits, petrology, isotope geology

Publications

Giordano, T.H. and S.E. Drummond. 1992. Acetate and chloride complexes of zinc in aqueous solution to 300-C. Electric Power Research Institute. *Proc. 2nd Int'l Symp. on Chem. in High Temp. Aqueous Solutions*. (In press).
Giordano, T.H. 1992. Experimental methods used to study metal-organic complexes. *Proc. 7th Int'l Symp. on Water-Rock Interactions*. (In press).
Giordano, T.H. 1992. Metal transport in ore fluids by organic liquid complexation. *The Role of Organic Acids in Geological Processes*. M.D. Lewan and E.D. Pittman (eds.), Springer-Verlag, New York, NY. (Submitted invited paper).
Giordano, T.H. and S.E. Drummond. 1991. Acetate and chloride complexes of zinc in aqueous solution to 300 C. Electric Power Research Institute. *Second Int'l Symp. on Chem. in High Temp. Aqueous Sol., Prog. Abs. and Bio.* p. 27.
Giordano, T.H. and S.E. Drummond. 1991. The potentiometric determination of stability constants for zinc acetate complexes in aqueous solutions to 295-C. *Geochimica et Cosmochimica Acta*. 55:2401-2415.
Giordano, T.H. 1990. Organic ligands and metal-organic complexing in ore fluids of sedimentary origin. *USGS Circular 1058*. pp. 31-41.
Mack, G., D.R. Cole, T.H. Giordano, W.C. Schaaf and J.H. Barcelos. 1991. Paleoclimatic controls on stable oxygen and carbon isotopes in caliche of the Abo Formation (Permian), south-central New Mexico, USA. *J. of Sedimentary Petrology*. 61:458-472.
Mack, G.H., S.L. Salyards, T.H. Giordano, D.R. Cole and W.C. James. 1990. Carbon and oxygen isotopes of caliche as an indicator of late Pliocene to middle Pliocene paleoclimate in south-central New Mexico. *Geol. Soc. of Amer., Abs. with Prog.*
Monger, H.C., D.R. Cole and T.H. Giordano. 1991. Stable isotopes in Pleistocene and Holocene aridisols of southern New Mexico. *Agron. Abs.* p. 317.

Research Support

T.H. Giordano	<i>Metal-organic Complexing and Metal Transport in Ore Fluids and Diagenetic Fluids of Sedimentary Origin</i>	
C. Monger T.H. Giordano D.R. Cole (Oak Ridge Nat'l Lab)	<i>Stable Isotopes in Pleistocene and Holocene Aridisols of Southern New Mexico</i>	
T.H. Giordano G. Mack J.C. James (Ohio State U) D.R. Cole (Oak Ridge Nat'l Lab)	<i>Carbon and Oxygen Isotopes of Caliche as an Indicator of Late Pliocene to Middle Pleistocene Paleoclimate in South-central New Mexico</i>	
T.H. Giordano	<i>Experimental and Theoretical Studies of Calcium and Magnesium Organic Complexing under Hydrothermal Conditions - American Chemical Society</i>	\$25,000 1/94-8/96

Related Team Efforts

Giordano currently is working with collaborators at the Oak Ridge National Laboratory on three projects related to global change and natural resources: 1) stable isotopes of Pliocene and Pleistocene paleosols; 2) stable isotopes of Pleistocene and Holocene paleosols (team effort with faculty in the agronomy department - these two projects are aimed at investigating paleoclimates and therefore fit into the global change efforts of various US scientific agencies); and 3) metal transport by metal-organic complexes in ore fluids related to sedimentary basins (this project ties into the DOE's investigation of hydrocarbon basin processes and the chemistry of aqueous solutions in stream generator plants).

Special Facilities and Holdings

Facilities: Soil, Water, Air Testing facility at NMSU; Electron Microscope facility at NMSU

Equipment: analytical equipment (SEM, optical microscopes, ICP, AA, chromatographs, etc.); machine shop; glass blowing

Aravamudan S. Gopalan

Chemistry and Biochemistry

Arts and Sciences

Box 30001 Dept. 3C

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Interests organic chemistry, synthetic methods, applications of enzymes in asymmetric synthesis, water use efficiency

Publications

Gopalan, A., V. Huber, O. Zincircioglu, and P. Smith. 1992. Novel tetrahydroxamate chelators for actinide complexation: Synthesis and binding studies. *J. Chem. Soc. Chem. Comm.* 1266.

Gopalan, A., H. Jacobs, and B. Mueller. 1992. Chiral gamma and delta hydroxysulfones via lipase catalyzed resolutions: Synthesis of (R)-(+)-4-Hexanolide and (2R, 5S)-2-Methyl-5-Hexanolide using intramolecular acylation. *Tetrahedron.* 48:8891.

Research Support

A.S. Gopalan	<i>Minimization and Remediation of DOE Nuclear Waste Problems Using Selective Actinide Chelators - DOE/NMSU WERC</i>	\$171,669 3/90-2/93
A.S. Gopalan	<i>Development of Novel and Cost Effective Polymeric Chelators for Applications in Radioactive Actinide Waste Remediation - DOE/NMSU WERC</i>	\$7,202 5/93-5/94
A.S. Gopalan	<i>Development of Novel and Cost Effective Polymeric Chelators for Applications in Radioactive Actinide Waste Remediation - DOE/NMSU WERC (proposal submitted)</i>	\$60,000 2/94-2/95

Champa S. Gopalan

Agronomy and Horticulture

Agriculture and Home Economics

Box 30003 Dept. 3Q PGEL

Phone 646-3405 FAX 646-6041 E-Mail

Interests biochemical genetics

Publications

Sengupta-Gopalan, C., S. Thomas, and J.D. Kemp. 1992. *Manipulation of Water Use Efficiency and Quality through Engineering of Nematode Resistance: Phase II.* Technical Report. NM Water Resources Research Institute.

Sengupta-Gopalan, C. and P.J. Langston-Unkefer. 1992. Isolation and characterization of molecular chaperons involved in the oligomerization/activation of two representative enzymes in ammonia assimilation, glutamine synthetase and asparagine synthetase in alfalfa. Seventh Ann. Symposium, Southwest Consortium on Plant Genetics and Water Resources. November 7-8, Lubbock, TX.

Research Support

C.S. Gopalan	<i>Effects of glutamine synthetase null mutations on growth, nodulation and N₂ fixation in alfalfa</i> - National Science Foundation	\$26,263 9/91-2/95
C.S. Gopalan	<i>Manipulation of water use efficiency and quality through genetic engineering of nematode resistance</i> - NM Water Resources Research Institute	\$49,805 7/90-6/92
C.S. Gopalan	<i>Impairment of Root Glutamine Synthetase Activity in Alfalfa by Antisense RNA Technology</i> - National Science Foundation	\$157,310 4/93-3/95
C.S. Gopalan	<i>Regulatory Mechanism of the Assembly and Turnover of Glutamine Synthetase in Root Nodules of Soybean</i> - USDA/Cooperative State Research Service (proposal submitted)	\$128,045 9/94-8/96

Foreign Experience

Gopalan will be part of a team traveling to The Netherlands in June to attend the 4th International Congress of Plant Molecular Biology.

William D. Gorman

Agricultural Economics and Agricultural Business
Agriculture and Home Economics
Box 30003 Dept. 3169
Phone 646-3923 FAX 646-3522 E-Mail

Interests agricultural business management, international marketing, resource economics

Publications

Gorman, W.D. 1992. Evolution of the food chain in a changing international environment. *Proc. Int'l Agribusiness Management Assoc. (IAMA) Symposium II*. Oxford, England.

Research Support

W.D. Gorman	<i>Agribusiness Research Plan</i> - USDA/Cooperative State Research Service	\$10,000 1/91-9/93
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Foreign Experience

Gorman traveled to Caracas, Venezuela to prepare for the next annual meeting of the International Agribusiness Management Association in May 1994.

Vincent P. Gutschick

Biology
Arts and Sciences
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Phone 646-5661 FAX 646-5665 E-Mail vince@nmsu.edu

Interests quantitative plant physiology/physiological ecology, drought tolerance, plant stress, water-use efficiency

Publications

- Gutschick, V.P. and C. Currier. 1992. *Increased Water-use Efficiency in Alfalfa by Selection for Two Key, Heritable Physiological Traits*. NM Water Resources Research Institute Tech. Comp. Rep. No. 263. Las Cruces, NM.
- Gutschick, V.P., J.C. Pushnik, and B.A. Swanton. 1991. Optimizing photosynthesis and water-use efficiency with the aid of models. Society Plant Physiology and Biochemistry. Indian Agricultural Research Institute, New Delhi. *Proc. Int'l Congress on Plant Physiology*. S.K. Sinha, P.V. Sane, S.C. Bhargava, and P.K. Agrawal (eds.). pp. 538-546.
- Gutschick, V. 1991. Modeling photosynthesis and water-use efficiency of canopies as affected by leaf and canopy traits. Chapter 4 of *Modeling Crop Photosynthesis: From Biochemistry to the Canopy*. K.J. Boote et al. (eds.). American Society of Agronomy/Crop Science Society of America. Madison, WI.
- Gutschick, V.P. 1990. Joining leaf photosynthesis models and canopy photon-transport models. *Photo-vegetation Interaction: Applications in Optical Remote Sensing and Plant Ecology*. R.B. Myneni and J. Ross (eds.). Heidelberg-Berlin: Springer.
- Kay, L.E. and V.P. Gutschick. 1991. Nonrecirculating hydroponic system suitable for uptake studies at very low nutrient concentrations. *Plant Physiology*. 95:1125-1130.

Research Support

V.P. Gutschick	<i>Physiological Control of Evapotranspiration by Vegetation</i> - NOAA	\$285,082
W. Whitford		9/91-8/94
T. Sammis		
L. Huenneke		
V.P. Gutschick	<i>Predicting Large-scale Patterns in Vegetated-surface Conductance for CO₂ and Water Vapor</i> - Department of Energy (proposal submitted)	\$101,069
B.Choudbury (NASA)		7/94-6/95
R.E. Dickinson (U of A)		
W. Schlesinger (Duke U)	<i>Long-term Ecological Studies in the Sonoran Desert (the Jornada LTER Consortium)</i> - National Science Foundation (proposal submitted)	\$3,780,000
V.P. Gutschick and others		10/94-10/00
M.A. O'Connell	<i>Native Plants and Plants Selected by Native Americans: A Training Group on Molecular and Physiological Mechanisms of Dryland Adaptation</i> - DOE/NSF/USDA (proposal submitted)	\$1,433,890
E. Serrano		1/95-12/99
V.P. Gutschick		

Foreign Experience

In July 1994 Gutschick will travel to the Australian National University in Canberra where he will work with the Ecosystem Dynamics Group initiating collaborative research on plant responses to light stress.

Related Team Efforts

Gutschick and collaborators' primary research aims are to understand how much plants' physiological control of their transpiration rate varies genetically and environmentally...yet shows sufficient regularity because of natural selection pressure that we may reliably predict total ET up to large spatial scales. Such predictions are important in estimating changes in the regional and global hydrologic cycles and earth's energy budget, hence, in estimating climatic changes as CO₂ levels increase. We are developing both models and experimental protocols (and equipment) some of which are novel (models of plant community tradeoffs in water-use and drought tolerance, methods of measuring plant conductance in the field, methods of growing plants at realistically low humidities in growth chambers by controlled dehumidification). Our group is university-wide; funding is national.

Special Facilities and Holdings

Facilities: Jornada LTER
Equipment: computerized plant growth chambers and greenhouse in the Dept. of Biology; field-portable open-mode gas-exchange system
Software: NAg Fortran library; graphics and statistics programs; many physiological and micrometeorological programs written by V. Gutschick

James H. Hageman

Chemistry and Biochemistry

Arts and Sciences

Box 30001 Dept. 3C Knox 214

Phone 646-2918 FAX 646-2649 E-Mail jhageman@nmsu.edu

Interests biochemistry, metabolism, proteolysis, Russian thistle, salt tolerance, calmodulin

Publications

- De la Peña, M. and J.H. Hageman. 1993. Protein degradation and catalase activity in *Bacillus subtilis* during sporulation. *FASEB J.* 7:A1188.
- Fowler, J.L., J.H. Hageman, K.J. Moore, M. Suzukida, H. Assadian, and M. Valenzuela. 1992. Salinity effects on forage quality of Russian thistle. *J. of Range Management.* 45:559-562.
- Fry, I.J., M. Becker-Hapak and J.H. Hageman. 1991. Purification and properties of an intracellular calmodulin-like protein from *Bacillus subtilis* cells. *J. Bacteriology.* 173:2506-2513.
- Hageman, J.H. and G.D. Kuehn. 1992. Boronic acid matrices for the affinity chromatography of glycoproteins and-enzymes. *Practical Protein Chromatography.* A. Kenney and S. Fowell (eds.). Humana Press, Clifton, NJ. pp. 45-71.
- Mbuyi-Kalala, A. and J.H. Hageman. 1990. Simulations of the Michaelis-Menten equation and the exact initial rate solution of the Michaelis-Menten model. 81st Annual Meeting ASBMB. June 3-7, New Orleans, LA. *FASEB J.* 4:A2301.
- O'Hara, M.B. and J.H. Hageman. 1990. Energy and calcium ion dependence during sporulation of *Bacillus subtilis* cells. *J. Bacteriology.* 172:4161-4170.
- Ramanujam, M.V. and J.H. Hageman. 1990. Intracellular transglutaminase (E.C. 2.3.2.13) in a procaryote: Evidence from vegetative and sporulating cells of *Bacillus subtilis* 168. 81st Annual Meeting ASBMB, June 3-7, New Orleans, LA. *FASEB J.* 4:A2321.
- Shankweiler, G.W. and J.H. Hageman. Characterization of a proteoglycan protease excreted by *Bacillus subtilis* cells during sporulation. *J. of Bacteriology.* (In preparation).
- Soundararajan, S., E.N. Dusler and J.H. Hageman. 1993. Structure of 4-Carboxy-2-Nitrobenzoic Acid. *Acta Cryst.* C49:690-693.

Research Support

J.H. Hageman

Response of Salsola Species (Russian Thistle, Tumbleweed) to Saline Water -

J.W. Fowler

No funding at present (Investigators have discovered a strong positive growth response of *Salsola* in greenhouse studies, to saline (NaCl + CaCl₂). With the highly favorable nutritional qualities we have established to be characteristic of this plant, the new results suggest this plant could be used for agricultural purposes to develop the many arable tracts of lands in New Mexico which lie over saline water supplies. In this connection we are interested in sustainable agriculture.)

J.H. Hageman

Regulation of Proteolysis in Bacillus Subtilis Cells - NIH MBRS

\$85,000
1990-95

J.H. Hageman

Acquisition of a 200 MHZ Nuclear Magnetic Resonance Spectrometer - DOD/Army Research Office

\$100,000
9/93-9/94

Special Facilities and Holdings

Facilities:

greenhouse fitted for delivering known concentrations of saline water to potted plants

Equipment:

usual equipment for monitoring physiological responses in plants and 400 MHZ nmr, diode array spectrometer, Gilford Response spectrometer, Packard Liquid Scintillation spectrometer, New Brunswick 75L fermenter and cell harvesters, two Pharmacia FPLC units, Sun computer facility, Hitachi electron microscope

Bibliographies:

nearly complete collection of references on biochemical and physiological studies on *Salsola*

Other:

supply of various selections of *Salsola* species

Adrian T. Hanson

Civil, Agricultural, and Geological Engineering
Engineering
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Interests environmental engineering

Research Support

A.T. Hanson	<i>City of Las Cruces Wellhead Protection Program: Phase I Groundwater Modeling - City of Las Cruces</i>	\$30,000 5/92-5/94
A.T. Hanson	<i>Large-Scale Column Studies Using Selective Chelators for the Removal of Lead from Contaminated Soils - Los Alamos National Laboratory</i>	\$34,934 9/92-2/94
A.T. Hanson	<i>Remediation of Mercury Contaminated Sites by Heap Leaching - Oakridge Institute of Science and Education (proposal submitted)</i>	\$50,024 6/93-5/94

Wilmer M. Harper

Agricultural Economics and Agricultural Business
Agriculture and Home Economics
Box 30003 Dept. 3169
Phone 646-3215 FAX 646-3522 E-Mail

Interests public policy, project evaluation

Research Support

W.M. Harper	<i>Microcomputer Applications in Agricultural Development - USDA/Office of International Cooperation and Development</i>	\$48,363 3/92-2/93
W.M. Harper	<i>Microcomputer Applications in Agricultural Development - US Department of Agriculture</i>	\$117,807 3/92-2/94
W.M. Harper J. Libbin	<i>Microcomputer Applications for the Financial Management of Agricultural and Rural Development Projects - US Department of Agriculture (proposal submitted).</i>	\$39,329 1/95-12/99

Foreign Experience

Harper and J. Veytia traveled to Paraguay in January 1993 to meet with Ministry of Agriculture and Universidad Nacional de Asuncion personnel to prepare a joint proposal to establish a master's program in environmental science and public policy. In November 1993 they went back to Paraguay to prepare the program for the 1994 national symposium on the environment.

Harper coordinated a short course entitled *Microcomputer Applications in Agricultural Development* for participants from Nigeria, Zimbabwe, Egypt, and Thailand.

Ceil A. Herman

Biology
Arts and Sciences
Box 30001 Dept. 3AF
Phone 646-1325 FAX 646-5665 E-Mail

Interests animal physiology

Publications

- Herman, C.A. 1992. Endocrinology of the amphibians. *Environmental Physiology of the Amphibia*. M. Feder and W. Burggren (eds.). University of Chicago Press. pp. 40-54.
- Herman, C.A., G.A. Charlton, and M. Chiono. 1992. Characterization of leukotriene C4 binding sites in the brain of the American bullfrog, *Rana catesbeiana*. *J. Exp. Zool.* 262:1-8.
- Herman, C.A., M. Chiono, J.J. Andazola, and O.A. Torres. 1992. Characterization and location of leukotriene C4 receptors in bullfrog lung. *J. Pharm. Exp. Therap.* 262:1248-1255.
- Herman, C.A., J.J. Andazola, J.A. Underwood, M. Chiono, and O.A. Torres. 1992. Leukotriene B4 and leukotriene B5 have binding sites on lung membranes and cause contraction of bullfrog lung. *J. Pharm. Exp. Therap.* 263:1117-1123.

Research Support

C.A. Herman	<i>Leukotriene Synthesis and Action Amphibians</i> - National Science Foundation	\$267,375 2/91-7/94
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R. Peter Herman

Biology

Arts and Sciences

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Interests microbial ecology/microbiology, chemical and environmental control of growth, development and physiological activity in primitive eukaryotes, nitrogen-fixer population dynamics in desert soils, microbiology

Publications

- Herman, R.P., G.W. Seager and K. Provencio. Effect of water and nitrogen addition on free-living nitrogen fixer populations in desert grass root zones. (Manuscript submitted).
- Herman, R.P., H.G. Bynum and A.B. Alexander. Interaction between the black yeast *Aureobasidium pullulans* and the gall midge *Lasioptera ephidricola* in gall formation on the desert shrub *Ephedra trifurca*. (Manuscript submitted).
- Herman, R.P. 1991. *Lipid Production from Algae Grown in Saline Water Using Low Intensity Culture Techniques*. NM Water Resources Research Institute Technical Completion Report No. 258, Las Cruces, NM.
- Herman, C.A., R.S. Heller and R.P. Herman. 1990. Leukotriene metabolism and action in amphibians: A model system. *J. Exp. Zoology*. 4:150-153.
- Herman, R.P., M.M. Luchini, Y.M. Martinez, C.A. Herman and A.D. Garcia. 1990. Cyclic nucleotides modulate lipoxigenase activity and reproduction in oomycetes. *Exp. Mycol.* 14:322-330.

Research Support

R.P. Herman	<i>Fungus, Insect and Plant Interactions in Gall Formation</i> - Proposal to NSF being contemplated	
R.P. Herman	<i>Mechanisms of Iodine Induced Spore Kill in Bacillus</i> - Medi-Flex, Inc. (graduate student support)	\$22,500/yr 3 years
R.P. Herman	<i>Free-living Nitrogen-fixer Population Dynamics in Desert Soils</i>	
R.P. Herman	<i>Interactions between the Fungus Aureobasidium and the Gall Midge Lasioptera Ephidricola in Gall Formation on the Shrub Ephedra Trifurca</i>	
R.P. Herman	<i>The Synthesis of Eicosanoids (Prostaglandins, C-20 Epoxy Alcohols, and C-20 Trihydroxy Acids) in Oomycetes and Their Role in the Regulation of Environmentally Triggered Growth and Development</i>	
R.P. Herman	<i>Graduate Research Assistantship</i> - Medi-Flex Hospital Prod, Inc.	\$67,500 8/91-7/94

Foreign Experience

Guest investigator, Department of Physiological Chemistry, Karolinska Institute, Stockholm, Sweden. Host investigator: Mats Hamberg. Research area: lipid metabolism in primitive eukaryotes

John W. Hernandez, Jr.

Civil, Agricultural, and Geological Engineering
Engineering
Box 30001 Dept. 3CE Civil Engineering 223
Phone 646-2311 FAX 646-6049 E-Mail

Interests water quality, pollution control

Publications

Hernandez, J. 1990. Stream standards for toxics and irrigated agriculture using New Mexico as a case study. Irrigation and Drainage. *Proc. 1990 Nat'l Conf. Amer. Soc. Civil Eng.* Durango, CO.
Hernandez, J. 1990. Solid waste landfill siting. New Mexico Environmental Forum: Environmental Issues. Seminar sponsored by the Cooperative Extension Service. Las Cruces NM.

Research Support

J.W. Hernandez	<i>Development of Permeable Barriers for Aquifer Restoration - DOE/NMSU</i>	\$68,828
J. Botsford	WERC	2/91-2/93
J.W. Hernandez	<i>State Engineer's Office Cooperative - NM State Engineer's Office (proposal submitted)</i>	\$20,481 8/93-12/93

Richard G. Hills

Mechanical Engineering
Engineering
Box 30001 Dept. 3450 Jett Hall 117
Phone 646-4342 FAX 646-6111 E-Mail

Interests flow and transport through porous media, numerical analysis

Publications

Hills, R.G. and P.J. Wierenga, with contributions from S. Luis, D. McLaughlin, M. Rockhold, J. Xiang, B. Scanlon, and G. Wittmeyer. 1994. INTRAVAL Phase II Model Testing at the Las Cruces Trench Site. NUREG/CR-6063, US Nuclear Regulatory Commission, Washington, DC. (In press).
Hills, R.G. and A.W. Warrick. 1993. Burgers' equation, a solution for soil water flow in a finite length. *Water Resources Research*. 29:4:1179-1184.
Hills, R.G., D.B. Hudson, and P.J. Wierenga. 1992. Spatial variability at the Las Cruces trench site. *Indirect Methods for Estimating the Hydraulic Properties Unsaturated Soils*. M.Th. van Genuchten, F.J. Leij, and L.J. Lund (eds.). US Salinity Laboratory, US Dept. of Agriculture, Riverside, CA.
Hills, R.G., M.R. Kirkland, and P.J. Wierenga. 1992. Algorithms for solving Richards' equation for variable saturated soils. *Water Resources Res.* 28:82049-2058.
Hills, R.G., P.J. Wierenga, D.B. Hudson, and M.R. Kirkland. 1991. The second Las Cruces trench experiment: Experimental results and two-dimensional flow predictions. *Water Resources Research*. 27:10.
Hills, R.G. and P.J. Wierenga. 1991. Model Validation at the Las Cruces Trench Site. NUREG/CR-5716, US Nuclear Regulatory Commission, Washington, DC.
Kirkland, M.R., R.G. Hills, and P.J. Wierenga. 1992. Algorithms for solving Richards' equation for variable saturated soils. *Water Resources Research*. 28:8:2049-2058.
Porro, I., P.J. Wierenga, and R.G. Hills. 1993. Solute transport through large uniform and layered soil columns. *Water Resources Research*. 29:4:1321-1330.

- Toorman, A.F., P.J. Wierenga, and R.G. Hills. 1992. Parameter estimation of hydraulic properties from one-step outflow data. *Water Resources Research*. 28:11:3021-3028.
- Wierenga, P.J., R.G. Hills, A.W. Warrick and T.C. Yeh. 1993. Controlled Field Study for Validation of Vadose Zone Models. NUREG/CR-6120, US Nuclear Regulatory Commission, Washington, DC. (In press).
- Wierenga, P.J., M.H. Young, G.W. Gee, R.G. Hills, C.T. Kincaid, T.J. Nicholson, and R.E. Cady. 1993. Soil Characterization Methods for Unsaturated Low-level Waste Sites. NUREG/CR-5980, US Nuclear Regulatory Commission, Washington, DC.
- Wierenga, P.J., R.G. Hills and D.B. Hudson. 1991. The Las Cruces trench site: Characterization, experimental results, and one dimensional flow predictions. *Water Resources Research*. 27:10.

Research Support

R.G. Hills	<i>Data Base for the Validation of Flow Transport Models in Unsaturated Soils</i> - University of Arizona	\$445,052 12/89-11/93
R.G. Hills	<i>Application of Flux Updating Water Flow Algorithm to Engineered Barriers</i> - Battelle Memorial Institute Pacific Northwest Labs	\$18,276 1/94-8/94

Robert V. Hoffman

Chemistry and Biochemistry
Arts and Sciences

Box 30001 Dept. 3C Chemistry 140
Phone 646-3528 FAX 646-2649 E-Mail

Interests organic chemistry, synthesis and synthetic methods, environmental chemistry, organic chemistry, chemistry occurring on surface of fly ash emitted from municipal incinerators

Publications

- Hoffman, R.V. and H.-O. Kim. 1992. Preparation of (2R)-2-Azidoesters from 2((p-Nitrobenzenesulfonyl)oxy) esters and their use as protected amino acid equivalents for the synthesis of di- and tripeptides containing D-amino acid constituents. *Tetrahedron*. 48:3007.
- Hoffman, R.V. and H.-O. Kim. 1992. A simple synthetic approach to Cbz-Phe-Psi-(CH₂)Gly-Pro-OMe and related peptide isosteres. *Tetrahedron Lett.* 33:3579.
- Hoffman, R.V. and J.M. Salvador. 1992. Cationic carbon to nitrogen rearrangements in the reactions of N-Sulfonyloxy amines with aldehydes. *J. Org. Chem.* 57:4487.
- Hoffman, R.V., N.K. Nayyar, and B.W. Klinekole. 1992. Efficient conversion of O-sulfonylated arylhydroxamic acids to 2-substituted secondary amides. *J. Amer. Chem. Soc.* 114:6262.
- Hoffman, R.V., N.K. Nayyar, and W. Chen. 1992. Base-promoted reaction of O-sulfonylated hydroxamic acids with nucleophiles - A new method for the synthesis of alpha-substituted amides. *J. Org. Chem.* 57:5700.
- Hoffman, R.V. and H.-O. Kim. 1991. Regiochemical control in the preparation of 2-Nosyloxy- β , τ -unsaturated esters and 4-Nosyloxy- α , β -unsaturated esters from trimethylsilylenediolates.
- Hoffman, R.V. 1991. Oxidative attachment of arenesulfonyloxy groups with arenesulfonyl peroxides. *Advances in Oxygenated Processes*. A.L. Baumstark (ed.). JAI Press: Greenwich, CT. 3:43-70.
- Hoffman, R.V. 1991. Synthetic transformations using arenesulfonyloxy groups, first as electrophiles, then as leaving groups. *Tetrahedron*. 47:1109-1135.
- Hoffman, R.V. and D. Stoll. 1991. Conversion of esters to 2-Acetoxy esters via 2-Nosyloxy esters. *Synth. Commun.* 21:223-227.
- Hoffman, R.V. and J.M. Salvador. 1991. A simple, one-flask transformation of ketones into N-methyl lactams. *Tetrahedron Lett.* 32:2429-2432.
- Hoffman, R.V. and D.J. Huizenga. 1991. A simple synthesis of 2,3-Diketoamides from 3-Ketoamides. *J. Org. Chem.* 56:6435-6439.
- Hoffman, R.V. and H.-O. Kim. 1991. Synthesis and reactions of 3-Hydroxy-2-Nosyloxyesters produced by the stereoselective reduction of 2-Nosyloxy-3-Ketoesters. *J. Org. Chem.* 56:6759.
- Long, Y.T., M.Q. Lu, R.V. Hoffman, and G.A. Eiceman. 1991. Gas chromatographic separation and determination of chloroanthracene isomers on fly ash. *J. Envir. Sci. (China)*.

Research Support

R.V. Hoffman	<i>Synthesis and Use of Sulfonyloxy Carbonyl Compounds as Synthetic Intermediates</i> - National Science Foundation	\$240,000
R.V. Hoffman	<i>Use of Sulfonylhydrazones in Azacyclic Synthesis</i> - NIH	\$230,000
R.V. Hoffman	<i>Thermally Stable Advanced Jet Fuels</i> - Sandia National Laboratories	\$18,000
R.V. Hoffman	<i>Azacyclic synthesis using N-sulfonyloxy amines</i> - DHHS/NIH	\$180,557 4/91-3/94

Jerry L. Holechek

Animal and Range Sciences

Agriculture and Home Economics

Box 30003 Dept. 3-I Knox Hall 318

Phone 646-1649 FAX 646-5441 E-Mail

Interests range ecology, livestock grazing in the Chihuahuan desert, impact of tanks on Ft. Bliss vegetation

Publications

- Boutouba, A., J.L. Holechek, M.L. Galyean, G. Nunez-Hernandez, J.D. Wallace, and M. Cardenas. 1990. Influence of two native shrubs on goat nitrogen status. *J. Range Mgmt.* 43:530-534.
- Holechek, J.L. 1992. Financial aspects of cattle production in the Chihuahuan desert. *Rangelands.* 14:145-149.
- Holechek, J.L. 1992. Financial benefit of range management practices in the Chihuahuan desert. *Rangelands.* 14:179-184.
- Holechek, J.L., D. Arthun, J.D. Wallace, M.L. Galyean, and M. Cardenas. 1992. Forb and shrub effects on ruminal fermentation in cattle. *J. Range Mgmt.* 45:519-522.
- Holechek, J.L. 1992. Quail of the far west. *Quail Unlimited Magazine.* 11:2:8-12.
- Holechek, J.L. 1992. Picking proper pheasant power. *American Rifleman.* 1400:44-48.
- Holechek, J.L. 1992. Hunting the all-season gamebird. *Shotgun Sports.* 14:4:46-56.
- Holechek, J.L., D.W. King, A.J. Prodomingo, J.D. Horton, and J.D. Wallace. 1992. Fecal output estimates for grazing steers using total collections and a controlled-release chromic oxide device. *Proc. West Sec. Amer. Soc. Anim. Sci.* Fort Collins, CO. 43.
- Holechek, J.L. and R.D. Pieper. 1992. Estimation of stocking rate on New Mexico rangelands. *J. Soil and Water Cons.* 47:116-119.
- Holechek, J.L. 1991. Chihuahuan desert rangeland livestock grazing and sustainability. *Rangelands.* 13:115-120.
- Holechek, J.L. 1991. Fee hunting: The exciting future. *Shotgun Sports.* 13:52-56.
- Holechek, J.L. 1991. Gamebirds and sustainable agriculture in the Palouse hills. *Quail Unlimited Magazine.* 10:8-13.
- Holechek, J.L., A.V. Munshikpu, L. Saiwana, G. Nunez-Hernandez, R. Valdez, J.D. Wallace and M. Cardenas. 1990. Influences of six shrub diets varying in phenol content on intake and nitrogen retention by goats. *Trop. Grasslands.* 24:93-98.
- Holechek, J.L. 1990. Livestock grazing and sustainability in the Chihuahuan desert. *New Mexico Resources.* 3:19-21.
- Holechek, J.L. 1990. Desert quail on the upswing. *Quail Unlimited Magazine.* 9:12-17
- Holechek, J.L. 1990. Grouse in the mountains. *American Hunter.* 18:42-46.

Research Support

J.L. Holechek	<i>Impacts of Livestock Grazing on the Chihuahuan Desert</i> - State funded project	\$15,000/year
J.L. Holechek M.K. Wood R.D. Pieper	<i>Impact of Tanks on Ft. Bliss Vegetation</i> - Support pending from US DOD/ARS	\$400,000 3 years

Special Facilities and Holdings

Facilities: College Ranch, Fort Bliss

Volney W. Howard, Jr.
 Fishery and Wildlife Sciences
 Agriculture and Home Economics
 Box 30003 Dept. 4901 Knox Hall 129
 Phone 646-1217 FAX 646-5975 E-Mail

Interests big game management, predator management, wildlife, pinyon-juniper, coyote population,

Publications

Barnitz, J.A., S.M. Armentrout, V.W. Howard, Jr., R.D. Pieper, and G.M. Southward. 1990. Vegetational changes following two-way cabling of pinyon-juniper in south-central New Mexico. *New Mexico State University Agricultural Experiment Station Bulletin No. 749.*

Barnitz, J.A., Jr., V.W. Howard, Jr. and G.M. Southward. 1990. Mule deer and rabbit use on areas of pinyon-juniper woodland treated by two-way cabling. *NMSU Ag. Exp. Stat. Bull. No. 752.*

Berry, R. and V.W. Howard, Jr. 1992. Preliminary results from a fee-hunting operation in central New Mexico. *Joint Annual Meeting, Arizona and New Mexico Chapters. The Wildlife Society. Thatcher, AZ.*

Del Frate, G. and V.W. Howard, Jr. 1990. Home range and movements of coyotes on the Jornada Experimental Range, New Mexico. *Joint Annual Meeting, Arizona and New Mexico Chapters. The Wildlife Society. Thatcher, AZ*

Del Frate, G. and V.W. Howard, Jr. 1990. Analysis of a coyote population trend using scent stations. *26th Western Student Wildlife Conclave. Arcata, CA.*

Howard, V.W., Jr., W.S. Rosier and M. Cardenas. 1992. Vegetational changes associated with mule deer habitat in south-central New Mexico. *NMSU Ag. Exp. Stat. Bull. No. 763.*

Howard, V.W., Jr., J.L. Holechek, R.D. Pieper, K. Green-Hammond, M. Cardenas and S.L. Beasom. 1990. Habitat requirements for pronghorn on rangeland impacted by livestock and net wire in east-central New Mexico. *NMSU Ag. Exp. Stat. Bull. No. 750.*

Howard, V.W., Jr., J.A. Barnitz, Jr. and G.M. Southward. 1990. Deer use in pinyon-juniper woodlands. *Proc. of the Symp. Managing Wildlife in the Southwest.* P.R. Krausman and W.S. Smith (eds.). pp. 10-20.

Howard, V.W., Jr. 1991. Management of non-traditional mammals of the pinyon-juniper woodlands. *Short Course in Integrated Management of Pinon-Juniper and Grassland Habitats in the Southwest,* B.C. Thompson and P.J. Zwank (coords.), January 7-11, Las Cruces, NM.

Howard, V.W., Jr. 1991. Effects of electric predator excluding fences on movements of mule deer in pinyon-juniper woodlands. *Wildlife Society Bull.* 19:331-334.

Howard, V.W., Jr. and G.G. Del Frate. 1991. Home ranges and movements of coyotes in the northern Chihuahuan desert. *Proc. of the Tenth Great Plains Wildlife Damage Control Workshop.* S.E. Hygnstrom (ed.). April 15-18, 1991, Lincoln, NE. pp. 39-49.

Research Support

V.W. Howard, Jr.	<i>McIntire-Stennis Gila N.F. Pinyon-juniper Ecology Project - supporting 1 Ph.D. and 3 M.S. candidates</i>	\$43,000/yr 1988-1993
V.W. Howard, Jr.	<i>Predator Ecology Project - Hatch funds (supporting 2 M.S. candidates)</i>	\$16,000/yr 1987-1990
V.W. Howard, Jr.	<i>Corona Ranch Wildlife Studies - supporting an M.S. candidate</i>	\$21,000/yr 1989-current
V.W. Howard, Jr.	<i>Feral Horse Relationships to Vegetational Communities and Wildlife Habitat in the Tularosa Basin, New Mexico - INT/Fish and Wildlife Service</i>	\$63,410 7/93-10/94

Related Team Efforts

Consultant for wildlife for various federal agencies in NM (SCS, BLM, TVA, Forest Service) and private firms (Utah Mining, United Nuclear Corp., Mobil Oil Co., El Paso Electric).
 Member of The Wildlife Society; Society for Range Management and National Geographic Society.

Ellis W. Huddleston

Entomology, Plant Pathology, and Weed Science
Agriculture and Home Economics
Box 30003 Dept. 3BE Gerald Thomas 299
Phone 646-3934 FAX 646-5975 E-Mail

Interests economic entomology and insect ecology, pesticide application, pesticide management, environmental impact of pesticides

Publications

- Huddleston, E.W. and R. Sanderson. 1991. Pesticide application science and safety. A Standard Operating Procedures Manual. NMSU Dept. of Entom., Plant Path., and Weed Sci.
- Huddleston, E.W. 1990. Economics of rangeland pest management. *Rangeland Entomology*. J.G. Watts (ed.). Edison Press: Denver, CO. pp. 280-281.
- Huddleston, E.W. 1990. Integrated pest management. *Rangeland Entomology*. J.G. Watts (ed.). Edison Press: Denver, CO. pp. 259-279.
- Huddleston, E.W. and R.D. Pieper. 1990. Editor of Snakeweed: Problems and Perspectives. Ag. Exp. Sta. Bull. 751.
- Huddleston, E.W. and R. Sanderson. 1990. Pesticide application technology. Snakeweed: Problems and Perspectives. E.W. Huddleston and R.D. Pieper (eds.). Ag. Exp. Sta. Bull. 751. pp. 61-69.
- Huddleston, E.W. and S. Coleman. 1990. Hercules B. t. Application Experiment. VT 754.
- Krupovage, J.R., E. W. Huddleston, and R. Valdez. 1990. Consumption and mortality of the white-footed mouse (rodentia: Muridae) and Ords kangaroo rat (rodentia: Heteromyidae) when fed carbaryl-bran grasshopper bait. *J. Econ. Entomol.* 83:2164-2167.

Research Support

E.W. Huddleston	<i>Pesticide Application Technology</i> - NM Agricultural Experiment Station and	
R. Sanderson	private industry	
E.W. Huddleston	<i>Aerial Application Field Trial</i> - Dow Elanco	\$9,000
R. Sanderson		8/92-10/92
E. Huddleston	<i>Adjuvants for Pesticide Sprays</i> - University of California	\$16,120
R. Sanderson		3/93-9/94
E. Huddleston	<i>Surfactant Effects on Pesticide Sprays</i> - University of California (proposal	\$19,320
R. Sanderson	submitted)	5/94-9/94

Foreign Experience

Huddleston presented a paper at the International Grasslands Conference held in New Zealand.

Special Facilities and Holdings

Equipment: agricultural spray aircraft; wind tunnel for measuring agricultural sprays

Laura F. Huenneke

Biology
Arts and Sciences
Box 30001 Dept. 3AF Foster Hall 113
Phone 646-3933 FAX 646-5665 E-Mail bio040@nmsu.vml

Interests plant ecology, desertification, rare species, biodiversity, conservation biology

Publications

- Huenneke, L.F. and R. Hobbs. 1992. Disturbance, diversity, and invasions: Implications for conservation. *Conservation Biol.* 6:324-337.

- Huenneke, L.F. 1991. Ecological implications of genetic variation in plant populations. Chapter 2. *Genetics and Conservation of Rare Plants*. D.A. Falk and K.E. Holsinger (eds.). Oxford Univ. Press. pp. 31-44.
- Huenneke, L.F., S.P. Hamburg, R. Koide, H.A. Mooney, and P.M. Vitousek. 1990. Effects of soil resources on plant invasion and community structure in Californian serpentine grassland. *Ecology*. 71:478-491.
- Huenneke, L.F. and R.R. Sharitz. 1990. Substrate heterogeneity and regeneration of a swamp tree, *Nyssa aquatica*. *Amer. J. Botany*. 77:413-419.
- Huenneke, L.F. and P.M. Vitousek. 1990. Seedling and clonal recruitment of the invasive tree *Psidium cattleianum*: Implications for management of native Hawaiian forests. *Biological Conservation*. 53:199-211.
- Schlesinger, W.J. Reynolds, G. Cunningham, L.F. Huenneke, W. Jarrell, R. Virginia, and W. Whitford. 1990. Biological feedbacks in global desertification. *Science*. 247:1043-1048.

Research Support

L.F. Huenneke	<i>Ecological Genetics of <u>Hedeoma todsenii</u></i> - Center for Plant Conservation (This project includes analysis of protein electrophoretic variation in an endemic clonal mint, and pollination experiments in the field to determine the plant's breeding system and the possibility of limited pollen exchange as a constraint on reproductive success)	\$4,000 8/91-9/92
L.F. Huenneke	<i>Ecological Studies of a Rare Shrub, <u>Lepidospartum burgessii</u></i> - Bureau of Land Management (This contract is supporting the establishment of monitoring studies on this extremely narrow endemic, in which little seed reproduction has been observed. Studies include demographic monitoring, hand pollinations to determine constraints on seed set, and observations of herbivory)	\$7,000 7/91-5/92
L.F. Huenneke	<i>Population Size and Density Effects on Population Viability: A Case Study of Two <u>Cirsium</u> Species</i> - National Science Foundation (Population size may influence the likelihood of visits from pollinators, attack by specialist herbivores, and other influences on reproductive success. Individuals of a rare endemic thistle, in populations across a range of sizes, are being monitored to develop empirical models of the relationship between population size and individual demographic performance. Experimental populations of a more common congener are being established to provide comparative information. The empirical data will be used to build more realistic projections of the viability (persistence time) of plant populations of various sizes)	\$118,000 8/91-7/94
L.F. Huenneke	<i>Global Climate Change and the Dynamics of Southern New Mexico Plant Communities</i> - Bureau of Land Management (Chihuahuan desert grasslands and shrublands comprise a mix of species of diverse growth forms and physiological traits. This project is characterizing the reproductive behaviors and requirements of dominant plants to provide the data necessary to model community changes to potential changes in regional climate and to changes in grazing management)	\$285,000 9/91-8/94
L.F. Huenneke W. Whitford 5 other PIs from NMSU	<i>Interactions of Time and Space Variability in a Chihuahuan Desert Ecosystem: Jornada LTER</i> - National Science Foundation	\$2,100,000
L.F. Huenneke	<i>Population Ecology of an Invading Tree in Hawaii Volcanoes National Park</i> - National Geographic Society	1987-88 now self-financed
L.F. Huenneke	<i>Biology of <u>Cirsium vinaceum</u>, a Threatened Plant Species</i> - NM Energy and Minerals Department	\$3,500 1/90-6/90

L.F. Huenneke *Jornada Long Term Ecological Research Program: Long Term Ecological Studies in the Chihuahuan Desert* - Duke University (proposal submitted) \$2,150,300
10/94-9/00

Foreign Experience

In June 1994 Huenneke accompanied two NMSU students to Guadalajara for meetings of the Society for Conservation Biology and the Association of Tropical Biology.

Special Facilities and Holdings

Facilities: LTER/Jornada Experimental Range and NMSU College Ranch (generally available); Lincoln National Forest (restricted use)
Bibliographies: bibliographies of work at Jornada to date - LTER office
Datasets: many from the Jornada Experimental Range and College Ranch - LTER has catalog

Ricardo B. Jacquez

Waste-management Education and Research Consortium

Engineering

Box 30001 Dept. WERC

Phone 646-2397 FAX 646-4149 E-Mail

Interests environmental engineering, haloform precursors by water pipe bacterial films, pollution impact on water quality from using saline groundwater for culture of catfish, waterborne disease giardiasis tailored smectites, adsorption of hazardous wastes

Publications

- Beach, M.I., R.B. Jacquez, F. Cadena and U. Shah. 1990. A computerized respirometric method for determining inhibition potential of wastewaters. *Proc. 45th Purdue Industrial Waste Conference*. Purdue University, May 1990, West Lafayette, IN.
- Bhada, R., R.B. Jacquez, L. Matthews, and J.D. Morgan. 1990. A consortium to address multidisciplinary issues of waste management. *Proc. Educating Engineers in the 21st Century*. ASEE Gulf-Southwest Section Annual Conference, March 1990, Waco, TX.
- Bhada, R., R.B. Jacquez, L. Matthews and J.D. Morgan. 1990. A consortium to address multidisciplinary issues of waste management. *Proc. 1st Interamerican Conference on Engineering Education*. July 1990, Puebla, Mexico.
- Jacquez, R. and R.K. Bhada. 1993. Professional development in environmental management through an industrial fellows program. *Proceedings of the MOET Conference*. June 1993, Chattanooga, TN.
- Jacquez, R. and R.K. Bhada. 1993. An international environmental fellows program: A university-national (DOE) lab consortium. *Proceedings of the 86th Annual Mtg. and Exhibition of the Air and Waste Management Assoc.* June 1993, Denver, CO.
- Jacquez, R.B. and D.J. Hartell. 1993. Biological mediation and effect of organic waste on iron and manganese reduction in soil. *Proceedings of the ASCE National Conference on Environmental Engineering*. July 1993, Montreal, Canada.
- Jacquez, R.B. and H. El-Rayes. 1992. Biochemical control of sulfide production in wastewater collection systems. *Proceedings of the ASCE National Conference on Environmental Engineering*. August 1992, Baltimore, MD.
- Jacquez, R.B. and F. Vora. 1991. Onsite treatment of septic-tank effluent by a rotating biological contactor—Optimization for organic removal. Second North American Water Management Seminar, April 1991, Chihuahua, Mexico.
- Jacquez, R.B., W.H. Zachritz, M.H. Li and M.I. Beach. 1991. Minimization of hazardous waste generation: Preliminary investigation of waste management properties of a solvent substitute for TCE. *Proc. ASCE Nat'l Conf. on Environ. Eng.* July 1991, Reno, NV.
- Jacquez, R.B., F. Vora, N. Kareem, D. Hartell and X. Wang. 1991. Onsite treatment of septic-tank effluent by a rotating biological contactor—Optimization of nitrification and denitrification. *Proc. ASAE Sixth National On-Site Sewage Symposium*. December 1991. (In preparation).
- Jacquez, R.B., W.H. Zachritz, M.H. Li and M.I. Beach. 1990. Minimization of hazardous waste generation: Preliminary investigation of waste management properties of a solvent substitute for TCE. *Proc. 45th Purdue Industrial Waste Conference*. Purdue University, May 1990, West Lafayette, IN.
- Jacquez, R.B., J. Golik and Z. Samani. 1990. Influence of method of fertilizer application on ground water pollution. *Proc. 1990 ASCE National Conference on Irrigation and Drainage Engineering*. July 1990, Durango, CO.

Martinez, B., R. Jacquez, W.H. Zachritz. 1992. Development of a protocol to evaluate volatility and biodegradability characteristics of turpene-based solvent substitutes. *Proceedings of the ASCE National Conference on Environmental Engineering*. August 1992, Baltimore, MD.

Zachritz, W.H., L. Lundie, R.B. Jacquez, and B.S. Martinez. 1992. Waste management characterization of terpene-based solvent substitutes for electronic circuit board manufacturing at Sandia National Laboratories. Final report submitted to Sandia National Lab, Sept. 30, Albuquerque, NM.

Research Support

R.B. Jacquez	<i>Waste-management Education and Research Consortium (WERC), College of Engineering - Department of Energy</i>	\$25M 1990-95
R.B. Jacquez	<i>Patricia Roberts Hams Fellowship - Department of Education</i>	\$96,000 1991-94
R.B. Jacquez	<i>A Pilot Program for the Development of an Educational Research Center Devoted to the Management of Radioactive, Hazardous and Solid Waste - Department of Energy</i>	\$25,000
R.B. Jacquez	<i>Minimization of Hazardous Waste Generation—Preliminary Investigation of Waste Management Properties of Solvent Substitutes for Trichloroethylene - Sandia National Laboratories</i>	\$176,864
R.B. Jacquez	<i>Long-term Effects of Sewage Lagoons and ET Beds on Groundwater Quality - NM Water Resources Research Institute</i>	\$39,155
R.B. Jacquez	<i>Incentive for Graduate Environmental Engineering Training - Arizona State University</i>	\$738 1/92-5/93
R.B. Jacquez	<i>Alliance for Minority Participation - National Science Foundation</i>	\$5,000,000 (in progress)
R.B. Jacquez	<i>Environmental Fellows Program - Department of Energy</i>	\$250,000 (in progress)
R.B. Jacquez W. Zachritz	<i>Minimization of Hazardous Waste Generation—Preliminary Investigation of Waste Management Properties of Solvent Substitutes for Trichloroethylene (TCE) - Sandia National Laboratories</i>	\$176,864
R.B. Jacquez	<i>Onsite Treatment of Septic Tank Effluent - NM Water Resource Research Institute</i>	\$47,242 completed
R.B. Jacquez	<i>NASA Graduate Student Researchers Program (under represented minority focus) Training Grant - NASA</i>	\$102,000
R.B. Jacquez	<i>Preliminary Evaluation of Waste Processing in a CELSS - NASA Ames Research Center</i>	\$6,560
R.B. Jacquez	<i>Implementation of a Hazardous Waste Management Program - US Army, Ft. Bliss, TX</i>	\$50,000
Z. Samani G. Smith R.B. Jacquez	<i>Denitrification as a Means to Remediate Groundwater Contaminated with Dairy Waste - USDA/Cooperative State Research Service</i>	\$50,000 9/93-9/95
W. Zachritz R.B. Jacquez	<i>Analysis of Biodegradability of Selected Solvent Substitutes - Sandia National Laboratories</i>	\$39,977 11/93-11/94

R.B. Jacquez	<i>Program to Enhance Minority Engineering, Scientific and Mathematical Education in New Mexico - Department of Defense (proposal submitted)</i>	\$4,972,915 10/93-9/98
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Foreign Experience

Jacquez along with R. Shoenmackers, H. Matteson and J. Burn, in February 1993, visited the Univ. Nacional Autonoma de Mexico to discuss mutual interest in space, astronomy, energy and environment.

Related Team Efforts

Jacquez participates in the Waste-management Education and Research Consortium and was named Director of Environmental Fellows Program in December 1992. The program trains professionals and world leaders in waste management and environmental remediation to develop an international community of environmental management professionals.

Special Facilities and Holdings

Facilities: Soil, Water, Air Testing Laboratory
Equipment: Electron microscope

Tim L. Jones

Agronomy and Horticulture
Agriculture and Home Economics
Box 30003 Dept. 3Q
Phone 646-6327 FAX 646-6041 E-Mail tjones@helen.nmsu.edu

Interests soils

Publications

Jones, T.L. 1992. Numerical Efficiency of Unsaturated Water Flow Models. Operational Methods to Characterize Soil Behavior in Space and Time. 1992 Conference of Working Group MV, International Society of Soil Science, Cornell University.
Xie, Q.B. and T.L. Jones. 1992. Evaluation of a new technique for reading soil psychrometers. *Proceedings of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, 68th Annual Meeting.* Tucson, AZ.

Research Support

T.L. Jones	Support to SWLA project 10603/DOE and performance assessment project 17262/NRC - Battelle Memorial Institute Pacific Northwest Labs	\$11,889 8/90-9/91
T.L. Jones	<i>Hydrology, Soil Chemistry and Data Tabulation</i> - Battelle Memorial Institute Pacific Northwest Labs	\$19,745 6/93-3/94
T.L. Jones Z. Samani	<i>An Expert System to Optimize Irrigation and Reduce Groundwater Contamination</i> - Intelligent Reasoning Systems, Inc. (proposal submitted)	\$10,386 5/94-2/95
T.L. Jones M.K. Wood	<i>Environmental Effects of Tank Manuevers on McGregor Range</i> - US Army Corps of Engineers	\$500,000 6/92-12/95
T.L. Jones C.M. Liddell	<i>Water Relations of P. Capsici</i> - New Mexico Chile Improvement Project	\$65,000 6/92-6/94

Satish J. Kamat

Industrial Engineering
Engineering
Box 30001 Dept. 4230 Jett Hall 159
Phone 646-2974 FAX 646-2976 E-Mail

Interests operations research, stochastic processes, engineering statistics, robotics

Research Support

S.J. Kamat *Employment Agreement for Dr. A.G. Walvekar - Macro International, Inc.* \$415,000
1/90-5/94

Related Team Efforts

Kamat has been a member of the planning committee and will be the concluding speaker of the Total Quality Management Forum (cosponsored by NMSU and Sandia National Labs). Forum is directed toward small businesses. Cost is being born by Sandia, and it is expected that there will be a \$15K-20K surplus at the end.

John D. Kemp

Plant Genetic Engineering Laboratory
Box 30001 Dept. 3GL
Phone 646-5453 FAX 646-5975 E-Mail

Interests plant molecular biology

Publications

Rajasekharan, R., R.C. Marians, J.M. Shockey and J.D. Kemp. 1994. Synthesis of photoreactive phosphatidylethanolamine and its interaction with phospholipase A². *Journal of Lipid Research*. 35:45-51.

Research Support

J.D. Kemp	<i>Industrial Oils from Desert Plants - USDA/Cooperative State Research Service</i>	\$188,833 6/94-9/95
J.D. Kemp R. Rajasekharan	<i>Lysophosphatidic Acid Acyltransferase: Enzyme and Gene Isolation from Soybean - US Department of Agriculture</i>	\$100,000 9/93-9/95
J.D. Kemp	<i>Biotechnology Career Fellowship - Rockefeller Foundation (proposal submitted)</i>	\$36,900 8/94-7/97

Foreign Experience

Kemp is scheduled to attend the 4th International Congress of Plant Molecular Biology and the 7th International Symposium on Molecular Plant-Microbe Interactions in Amsterdam this summer. In February 1994 he traveled to Moscow and Kazakhstan with H. Matteson, D. Matthews, and J. Waelti to initiate cooperation in the areas of agriculture, natural resources, and the environment.

Nirmala N. Khandan

Civil, Agricultural, and Geological Engineering
Engineering
Box 30001 Dept. 3CE
Phone 646-3801 FAX 646-6049 E-Mail

Interests environmental engineering, organic compounds, pollution control, environmental modeling

Publications

Khandan, N.N. and R.E. Speece. 1993. Prediction of activated carbon adsorption capacities for organic vapors using QSAR methods. *Env. Sci. and Tech.* 27:8:1512.
Khandan, N.N. 1993. Toxicity of mixtures of organic chemicals to microorganisms. *Water Research*. 28:3:543.
Khandan, N.N., R.E. Speece, G. Peace and W. Jang. 1993. Operation of counter-current air-stripping towers at higher loading rates. *Wat. Res.* 27:5:807.

- Khandan, N.N., J. Peace, and A. Shanbhag, 1992. *Low Volatile Organics in Groundwater: Techno-Economic Evaluation of an Innovative Process*. NM Water Resources Research Institute Tech. Rpt. No. 270, NMSU, Las Cruces, NM.
- Khandan, N.N., W. Jang, and R.E. Speece. 1992. Removal of 1,2 Dibromo-3-chloropropane by cascade air-stripping. *J. Env. Engrg. ASCE*. 118:2:226.
- Khandan, N.N., J. Peace, A. Shanbhag, and R. Speece. 1992. Cascade air-stripping: Techno-economic evaluation of a new groundwater treatment process. *Groundwat. Mon. Rev.*, Spring, pp. 100-104.
- Khandan, N.N., R. Speece, W. Jang, J. Peace and D. Barnes. 1991. Cascade air-stripping: A new technology to meet new regulations. *Chem. Eng. Comm.* 102:4:47-58.
- Khandan, N.N., W. Jang, and R.E. Speece. 1991. Cascade air-stripping pilot and prototype scale experience. *J. Env. Engrg. ASCE*. 117:6:788.
- Prakash, J., N.N. Khandan, and R.E. Speece. 1994. Prediction of activated carbon adsorption isotherms for organic vapors. *Env. Sci. and Tech.* (In press).
- Speece, R.E., N.N. Khandan, and D.J.W. Blum. 1991. *Organic Substances and Sediments in Water*, Vol. II. Lewis Publishers. 15:324.
- Sun, B., N.N. Khandan, E. Hall, X.M. Wang and J. Prakash. 1994. Estimating toxicity of organic chemicals to activated sludge. *Jour. Env. Eng. ASCE*. (In press).
- Tang, N.H., N.N. Khandan, and R.E. Speece. 1992. QSAR parameters for toxicity of organic chemicals to nitrobacter. *J. Env. Engrg. ASCE*. 118:1:17.
- Tellez, G.T., and N.N. Khandan. 1993. Bioreclamation of oil-field produced waters-characterization and feasibility study. *Produced Water*. J.P. Ray and F.R. Engelhart (eds.). Plenum Press. pp. 523-533.

Research Support

N.N. Khandan	<i>Low Volatile Organics in Groundwater—Techno-economic Evaluation of an Innovative Treatment Process</i> - US Geological Survey through NM Water Resources Research Institute	\$58,421 7/90-7/92
N.N. Khandan	<i>Cascade Air-stripping System for NASA-WSTF</i> - NASA/Geoscience Consultants Ltd.	\$10,540 completed
N.N. Khandan	<i>Bioremediation of Oil-field Production Pit Sludges</i> - DOE/WERC (completed)	\$83,477 3 yr project
N.N. Khandan	<i>Modeling Joint Effects of Mixtures of Chemicals on Microorganisms Using QSAR Techniques</i> - Air Force Office of Scientific Research	\$323,459 3 yr project in progress
N.N. Khandan	<i>Biological Treatment of Gaseous Streams Contaminated with Organic Vapors</i> - DOE/WERC	\$103,460 2 yr project in progress

Foreign Experience

Khandan will travel to the People's Republic of China as part of the Water Pollution Technology Delegation. He is also scheduled to travel to Budapest, Hungary where he will present a paper entitled "Toxicity of Uniform Mixtures of Organic Chemicals to Microorganisms." Khandan presented a paper in Perth, Australia entitled "Predicting Toxicity of Mixtures of Organic Chemicals Using Models Based on Molecular Structures."

Special Facilities and Holdings

Field Laboratory: full-scale model of cascade air-stripper

Herman E. Kiesling

Animal and Range Sciences
Agriculture and Home Economics
Box 30003 Dept. 3-I Knox Hall 328
Phone 646-1714 FAX 646-5441 E-Mail

Interests rangeland management, integration of rangeland and irrigated pasture for a sustainable agricultural system, animal nutrition, management of beef cattle, sheep, goats

Publications

- Howard, P.L., H.E. Kiesling, C.E. Barnes and T.T. Ross. 1991. Nutrient composition of alfalfa stems and leaves. *Proc. Western Section of the American Society of Animal Science*. 42:296.
- Jack, N.E., H.E. Kiesling, T.T. Ross and J.B. Armstrong. 1991. Effects of undamaged, rain-damaged and moldy alfalfa hay on growth, blood constituents and digestibility in Quarter Horse foals. *Proc. Twelfth Equine Nutrition and Physiology Society Symposium*.
- Kiesling, H.E. 1992. High moisture roughage. *CA Agri-business Dairyman*. 11:5:12.
- Kiesling, H.E., C.E. Barnes, and T.T. Ross. 1992. Summer grazing of alfalfa with angora goats. *Hay Market News*.
- Kiesling, H.E., C.E. Barnes, T. Ross, J. Libbin, M. Ortiz, and K.W. Duncan. 1992. Marketing alfalfa hay using sheep. *Ag. Sci. Center Artesia Ann. Rep.*
- Kiesling, H.E., P.B. Kloppenburg, G.B. Donart, and R.E. Kirksey. 1992. Animal performance of steers grazing cool- and warm-season perennial grasses. *Livestock Research Briefs and Cattle Growers Short Course*. Las Cruces, NM. pp. 33-36.
- Kiesling, H.E., P.B. Kloppenburg, G.B. Donart, and R.E. Kirksey. 1992. Forage yield and animal performance on irrigated cool- and warm-season perennial grasses. *Livestock Research Briefs and Cattle Growers Short Course*. Las Cruces, NM. p. 63.
- Kiesling, H.E., J.T. Park, G.B. Donart, R.E. Kirksey, and L. Murray. 1992. Forage production and quality of warm- and cool-season perennial grasses under irrigated conditions. *Livestock Research Briefs and Cattle Growers Short Course*. Las Cruces, NM. p. 64.
- Kiesling, H.E., P.L. Howard, T.T. Ross, and C.E. Barnes. 1992. Nutrient composition of alfalfa as influenced by grazing during the summer growing season. *Proc. West. Sec. Amer. Soc. Anim. Sci.* 43:203-204.
- Kirksey, R.E., H.E. Kiesling and M. Ortiz. 1991. Steer performance on irrigated pastures at Tucumcari, New Mexico. *NMSU Ag. Exp. Stat. Research Report* 654.
- Kloppenburg, P.B., H.E. Kiesling, G.B. Donart and R.E. Kirksey. 1991. Beef production on selected cool- and warm-season perennial grasses. *Proc. Western Section of the American Society of Animal Sciences*. 42:170.
- Malcolm, K.J. and H.E. Kiesling. 1990. Effects of whole cottonseed and live yeast culture on rumen fermentation, digestion and fluid passage rate in steers. *J. Anim. Sci.* 68:1965.
- Manzanares, D., J.P. Neel, J.L. Holechek, H.E. Kiesling, G.B. Donart, T. Goodman and G.M. Southward. 1991. Cattle diets on riparian and upland New Mexico pinyon-juniper ranges. *NM J. Science*.
- Mars, L.A., H.E. Kiesling, T.T. Ross, J.B. Armstrong and L. Murray. 1992. Water acceptance and intake in horses under shipping stress. *J. Equine Vet. Sci.* 12:1.
- Mars, L.A., H.E. Kiesling, T.T. Ross, J.B. Armstrong and L. Murray. 1991. Water acceptance and intake in horses under shipping stress. *Proc. Twelfth Equine Nutrition and Physiology Society Symposium*.
- Tejada Velez, E.H., H.E. Kiesling, R.F. Beck and G.M. Southward. 1991. Grazing behavior of angora goats confined to a semidesert mesquite brush dominated rangeland. *Proc. Western Section of the American Society of Animal Sciences*. 42:177.

Research Support

- H.E. Kiesling
T.T. Ross
J.F. Smith
Gossypol/Dairy Heifer: Effect of Gossypol on Growing Dairy Heifers
- H.E. Kiesling
C.E. Barnes
J. Libbin
M. Ortiz
T.T. Ross
K.W. Duncan
Sheep/Alfalfa: Marketing Alfalfa Using Sheep
- H.E. Kiesling
R.E. Beck
Goats/Brush Control: Brush Control Using Goats on Semidesert Rangeland
- R.E. Kiesling
R.E. Kirksey
G.B. Donart
Tucumcari Forage: Irrigated Pasture and Forage Evaluation for Eastern New Mexico

Foreign Experience

Kiesling has been selected to participate in the Winrock International Farmer-to-Farmer Program and will be in Kyrgyzstan during May and June 1994. Extensive travel in Mexico for the past 12 years for university and personal purposes. Kiesling spent four weeks in China during summer 1991 to develop cooperative research and extension projects. A second trip was completed in 1993 with Beck and Sachse (10 days in Sansu Provence).

Related Team Efforts

All research projects have been conducted as a team effort with scientists at research centers in New Mexico or on campus.

J. Phillip King

Civil, Agricultural, and Geological Engineering

Engineering

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Phone 646-3801 FAX 646-6049 E-Mail jpkings@nmsu.edu

Interests agricultural engineering, groundwater, wellhead protection, contaminant transport, small on-site sewage treatment

Publications

- Durnford, D.S. and J.P. King. 1993. An experimental study of the processes and particle size distributions of eroded soil. *J. Irr. Drainage*. American Society of Civil Engineers. March-April.
- King, J.P., I. Broner, R.L. Croissant, C.W. Basham. 1991. Malting barley water and nutrient management knowledge-based system. *Transactions of the ASAE*. 4:6:2622-2630.
- King, J.P. and Israeli-Broner. 1990. Inductive rule extraction for an irrigation management expert system. *Computer Appl. in Ag.* 5:2.
- King, J.P. and R. Oad. 1989. The North Poudre Irrigation Company: Farmer managed irrigation in northeastern Colorado, USA. *J. Int'l Irr. Management Institute*. December.
- Oad, R., and J.P. King. 1990. Irrigation system design and management in mountainous areas. *J. Irrigation and Drainage*. Kulwar Publishers: The Netherlands.

Research Support

J.P. King	<i>Writing Across the Curriculum</i>	
J. Ham		
J.P. King	<i>Unsaturated Flow through Engineered Barriers - WERC</i>	\$38,000
T. Jones		
J.P. King	<i>Unsaturated Flow through Textural Interfaces in Engineered (Capillary) Barriers - DOE/WERC</i>	\$11,889
T. Jones		2/92-2/93
J.P. King	<i>Water Conservation Study - NM Water Resources Research Institute</i>	\$14,067
		7/93-6/94
J.P. King	<i>Economic Optimization of River Management Using Genetic Algorithms -</i>	\$24,576
F.A. Ward	NM Water Resources Research Institute (proposal submitted)	7/94-6/95

Foreign Experience

Peace Corp volunteer/irrigation engineer/land husbandry officer, Malawi, Africa. Designed and supervised construction of irrigation schemes. Developed and implemented plans for rehabilitation, maintenance, and operation of existing schemes. Directed research and extension aimed at soil conservation. Conducted irrigation trials on maize, cotton, vegetables, and tree crops. Organized and conducted workshops covering soil-water relationships, irrigation scheduling, system maintenance, and crop management.

Special Facilities and Holdings

Agricultural Engineering Computer/Instrumentation Lab (very limited availability)

James E. Knight

Cooperative Extension

Agriculture and Home Economics

Box 30003 Dept. 3AE Gerald Thomas 121

Phone 646-1164 FAX 646-5975 E-Mail jknight @ nmsu.edu

Interests wildlife enterprises, environmental education, wildlife management, multiple-use management

Publications

Dixon, C.A. and J.E. Knight. 1993. Mearn's quail in New Mexico. NM Coop. Ext. Serv. Guide. (In press).

Knight, J.E. and G. Knadle. 1993. *Discovering Wildlife in America*. FFA Manual. (In press).

Knight, J.E. 1993. Skunks. *Handbook on Prevention and Control of Wildlife Damage*. Great Plains Agriculture Council. (In press).

Knight, J.E., J.M. Fowler, and C.M. Morgan. 1993. Expenses and income associated with fee hunting enterprises on New Mexico ranches. NMSU Range Improvement Task Force. (In press).

Knight, J.E. and C.H. Morgan. 1993. Vertebrate pest management for New Mexico. NMSU Coop. Ext. Service/NM Dept. of Ag. Circular. 79 pp. (In press).

Knight, J.E. 1992. The Endangered Species Act: Does it really help endangered species? RITF Report.

Knight, J.E. and C.H. Morgan. 1989. Legal liability of landowners with fee hunting enterprises. NMSU Range Improvement Task Force. Report 25.

Research Support

J.E. Knight	<i>Development of a Master Environmentalist Program to Educate Elementary,</i>	\$10,000
H.E. Eves	<i>Middle and High School Children - US Fish and Wildlife Service</i>	

J.E. Knight	<i>A Pilot Study of the Master Environmentalist Program in Elementary and Intermediate Education - INT/Fish and Wildlife Service</i>	\$10,000 9/91-9/93
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J.E. Knight	<i>Forest Ecosystem Management in the Southwest through Multi-interest Involvement - US Department of Agriculture (proposal submitted)</i>	\$19,360 7/94-7/95
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Glenn D. Kuehn

Chemistry and Biochemistry

Arts and Sciences

Box 30001 Dept. 3C Knox Hall 214

Phone 646-1015 FAX 646-6846 E-Mail

Interests biochemistry, enzyme synthesis, drought and heat stress tolerances in plants, metal ion-stress tolerance mechanisms in plants, genetic cloning of enzymes of polyamine metabolism in plants, photosynthesis, wound-repair mechanisms in plants by transglutaminase

Publications

Bagga, S., A. Dharma, G. Phillips and G.D. Kuehn. 1991. Evidence for the occurrence of polyamine oxidase in the dicotyledonous plant, *Medicago sativa* L. (alfalfa). *Plant Cell Reports*. 10:550-554.

Garver, W.S., J.D. Kemp and G.D. Kuehn. 1993. Partial purification and kinetic characterization of acylCoA:alcohol transacylase from developing jojoba cotyledons. *Plant Physiology (ALS)*. (In press).

Garver, W.S., J.D. Kemp and G.D. Kuehn. 1992. A high performance liquid chromatography-based radiometric assay for acylCoA:alcohol transacylase. *Analytical Biochemistry*. 196:335-340.

- Hageman, J.H. and G.D. Kuehn. 1992. Boronic acid matrices for the affinity purification of glycoproteins and enzymes. *Practical Protein Chromatography. Methods in Molecular Biology Series*. A. Kenney and S. Rowell (eds.). The Humana Press Inc.: Clifton, NH. pp. 45-71.
- Klein, J.D., E. Guzman and G.D. Kuehn. 1992. Purification and partial characterization of transglutaminase from *Physarum polycephalum*. *J. Bacteriology*. 174:2599-2605.
- Kuehn, G.D., J.D. Klein, and E. Guzman. 1992. Purification and partial characterization of transglutaminase from *Physarum polycephalum*. *J. Bacteriol.* 174:2599-2605.
- Kuehn, G.D., M.R. Bruce-Carver, M.A. Kopecki, A. Dharma, and S.A. Margosiak. 1992. Evidence for the presence of a gamma-glutamyl-epsilon-lysine crosslink in a putative transglutaminase-catalyzed dimer of ribulose 1,5-biophosphate carboxylase/oxygenase large subunit from *Medicago sativa* (alfalfa). *Sixth Ann. Mtg. Southwest Consortium on Plant Genetics and Water Resources*. November 7-8, Lubbock, TX. p. 18.
- Kuehn, G.D., S.A. Adeogba, K.M. Sullivan, O.M. Bacon, and C.A. Janeway. 1992. Anti-CD28 enhances anti-CD3-induced proliferation of primary CD4 T cells. *Minorities Access to Research Careers and Minorities Biomedical Research Support Program Symposium*. October 22-24, Dorado Beach, Puerto Rico. p. 70.
- Kuehn, G.D., S. Bagga, B. Rodriguez-Garay and G.C. Phillips. 1990. Biosynthesis of uncommon polyamines in higher plants and their relationship to abiotic stress responses. *Polyamines and Ethylene: Biosynthesis, Physiology and Interactions*. H.E. Flores, R.N. Arteca and J.C. Shannon (eds.). ASPP Press, Rockville, MD. pp. 190-202.
- Kuehn, G.D., B. Rodriguez-Garay, S. Bagga and G.C. Phillips. 1990. Novel occurrence of uncommon polyamines in higher plants. *Plant Physiology*. 94:855-857.
- Margosiak, S.A., A. Dharma, A.P. Gonzales, D. Louie and G.D. Kuehn. 1990. Identification of the large subunit of ribulose 1,5-biophosphate carboxylase/oxygenase as a substrate for transglutaminase in plants. *Plant Physiology*. 92:88-96.
- Phillips, G.C. and G.D. Kuehn. 1991. Uncommon polyamines in plants and other organisms. *Biochemistry and Physiology in Plants*. R.D. Slocum and H.E. Flores (eds.). CRC Press Uniscience. Cleveland, OH. pp. 121-136.

Research Support

G.D. Kuehn	<i>Biomedical Research for Ethnic Minority Students</i> (The grant supports 14 faculty subprojects, 30 undergraduate student research participants, 14 graduate research assistants) - NIH	\$2,141,510 9/91-9/95
G.D. Kuehn	<i>Somatic Cell Selection to Genetically Improve Plant Water Use Efficiency and Tolerance to Stress</i> (The aims of this project are to develop whole plant strains of drought-tolerant alfalfa and heat-tolerant cotton by selecting single cells from cultures that have been forced to overproduce select polyamines by growth in the presence of metabolic inhibitors of the polyamine biosynthetic pathways) - US Geological Survey	\$74,922 7/89-6/92
G.D. Kuehn G. Phillips	<i>Drought-stress Regulated Genes for Carbamoyl-phosphate and Polyamine Biosynthesis</i> (The principal aims of this project are to clone, isolate, and characterize the genes for carbamoylphosphate synthase and polyamine oxidase from alfalfa. The nucleotide probes and antibody probes prepared in this project are being used to study drought-induced and heat-induced expression of these genes and their protein products in order to identify mechanisms that confer tolerances to these stresses) - US Department of Agriculture	\$261,000 4/86-5/93
G.C. Phillips G. Kuehn S. Bagga	<i>Isolation of Genes Coding for Plant Polyamine Biosynthetic Enzymes</i> - US Department of Agriculture (funded and in progress)	\$110,000 9/93-9/95
G.D. Kuehn	<i>Bridges to the Baccalaureate Degree for American Indians</i> - DHHS/NIH (proposal submitted)	\$647,996 10/94-9/98

Related Team Efforts

University and regional-wide level: Southwestern Consortium on Plant Genetics and Water Resources. Includes New Mexico State Univ., Los Alamos Nat'l Lab., Texas Tech Univ., Univ. of Arizona, and UC/Riverside.

Special Facilities and Holdings

Facilities: Plant Genetic Engineering Laboratory
Equipment: High performance liquid chromatographic systems for quantitation of polyamines (putrescine, spermidine, spermine, caldine, thermine and other uncommon polyamines)
Other: Access to isogenic strains of alfalfa that are progressively drought tolerant. Access to isogenic strains of cotton that are progressively heat tolerant.

Peter J. Lammers

Chemistry and Biochemistry
Arts and Sciences
Box 30001 Dept. 3C Chemistry 125
Phone 646-3918 FAX 646-6846 E-Mail plammers@nmsu.edu

Interests cyanobacteria, genome rearrangements, water-stress proteins, DNA sequencing

Publications

Close, T.J. and P.J. Lammers. 1993. An osmotic stress protein of cyanobacteria is immunologically related to higher plant dehydrins. *Plant Physiology*. 101:773-779.
Lammers, P.J., M.J. Spence, and M.T. Henzl. 1991. The structure of a phaseolus vulgaris cDNA encoding the iron storage protein ferritin. *Plant Mol. Biol.* 17:499-504.

Research Support

P.J. Lammers	<i>Expression and Function of a Highly Conserved Water Stress Protein - NM Water Resources Research Institute</i>	\$25,000 7/93-6/94
P.J. Lammers	<i>Distribution and Activity of Dehydrin-like Proteins in Plants and Cyanobacteria - US Department of Agriculture</i>	\$65,000 8/93-7/95
P.J. Lammers	<i>Biochemistry and Genetics of Salt and Desiccation Tolerance: The Case of Dehydrin Proteins - NM Water Resources Research Institute (proposal submitted)</i>	\$25,000 7/94-6/95

Robert R. Lansford

Agricultural Economics and Agricultural Business
Agriculture and Home Economics
Box 30001 Dept. 3169
Phone 646-3105 FAX 646-3522 E-Mail

Interests natural resources, production economics, water resources

Publications

Lansford, R.R. and T.M. Cohen. 1992. Survey of cotton gin and oil seed trash disposal practices and preferences in the western U.S. Ag. Exp. Sta. Tech. Rep. 12.
Lansford, R.R., T.M. Cohen, and L. Adcock. 1992. The economic impact of Los Alamos National Laboratory and Sandia National Laboratories on the state of New Mexico, FY 1990. Ag. Exp. Sta. Tech. Rep. 7.
Lansford, R.R., L. Dominguez, C. Gore, J. Hand, F.G. West, B. Wilson, and T.M. Cohen. 1992. Sources of irrigated water and irrigated and dry cropland acreages in New Mexico, by county, 1988-90. Ag. Exp. Sta. Tech. Rep. 4.
Lansford, R.R. and L.D. Adcock. 1992. The social and economic impact of the Department of Energy on the state of New Mexico, Fiscal Year 1991. U.S. Dept. of Energy and Ag. Exp. Stat. Rep.

Research Support

R.R. Lansford	<i>A Water Use Program - INT/US Geological Survey</i>	\$10,300 7/91-6/92
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R.R. Lansford	<i>Analysis of Wood Pellet Demand in the Albuquerque Area - NEOS Corporation</i>	\$4,000 5/93-8/93
R.R. Lansford	<i>US Department of Energy Sociological and Economic Impacts - US Department of Energy</i>	\$180,000 8/92-7/95

Foreign Experience

Lansford attended the International Agribusiness Management Association World Congress in Caracas, Venezuela in May.

Craig M. Liddell

Entomology, Plant Pathology, and Weed Science
Agriculture and Home Economics
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Phone 646-4110 FAX 646-5975 E-Mail cliddell@crl.nmsu.edu

Interests plant pathology

Publications

- Biles, C.L., D.L. Lindsey and C.M. Liddell. 1992. Control of *Phytophthora* root rot of chile peppers by irrigation practices and fungicides. *Crop Protection*. 11:225-228.
- Liddell, C.M., C.A. Waddell and J.P. McEntee. 1993. Teliospore germination in *Puccinia grindeliae*, rust of the rangeland weed *Gutierrezia sarothrae*. *Plant Disease*. 77:149-152.
- Liddell, C.M. and D.N. Hansen. 1993. Visualizing complex biological interactions in the soil ecosystem. *The Journal of Visualization and Computer Animation*. 4:3-12.
- Liddell, C.M. 1992. An experimental method to measure the compression of soil around emerging wheat coleoptiles. *Soil Biology and Biochemistry*. 24:5:471-477.
- Liddell, C.M. 1992. Methods for the measurement and control of soil moisture and temperature. *Methods for Research with Soilborne Phytopathogenic Fungi*. APS Press: St. Paul, MN. pp. 187-203..
- Liddell, C.M. 1992. Spatial patterns of broom snakeweed mortality induced by *Puccinia grindeliae*. Abstract. *Phytopathology*. 82:1130.
- Liddell, C.M., E.S. Indiogine, C.L. Biles, and J.P. McEntee. 1992. Biological control of and phycap. on chile peppers with several fungal and bacterial strains. Abstract. *Phytopathology*. 82:1129-1130.

Research Support

C.M. Liddell	<i>1991 Peanut Improvement Project - NM Peanut Commission</i>	\$3,000 7/90-6/92
C.M. Liddell C. Biles	<i>Regional Survey of Bacteria and Cercospora Leaf Spot on Chile - NM Chile Commission</i>	\$6,500 7/92-6/93
C.M. Liddell	<i>Identification and Characterization of Chile Pepper Virus - United New Mexico Bank</i>	\$500 8/93-8/94
C.M. Liddell C. Biles R. Byford	<i>Acquisition of Equipment for Research in the Molecular Biology of Plant Protection Sciences - National Science Foundation (proposal submitted)</i>	\$84,655 1/94-12/94

William C. Lindemann

Agronomy and Horticulture
Agriculture and Home Economics
Box 30003 Dept. 3Q
Phone 646-1907 FAX 646-6041 E-Mail

Interests soil microbiology

Publications

- Barton, L.L., H.E. Nuttall, Jr., R.C. Blake III, and W.C. Lindemann. 1992. Biological transformation of heavy elements resulting in colloid formation. *Symposium: Fundamental Advances in Bioremediation of Hazardous Chemical and Nuclear Wastes*. Amer. Inst. Chem. Eng. Nat'l Mtg. Minneapolis, MN. p. T-11.
- Barton, L.L., W.C. Lindemann, and D.L. Bearden. 1992. Colloid formation as an approach to remediate toxic wastes containing chromium and lead. *Waste Management 1992*. R.G. Post (ed.). Tucson, AZ. 2:1305-1308.
- Purves, P.M., W.C. Lindemann, and T.J. Wacek. 1992. Application of rhizobium through a center pivot irrigation system. *Agron. Abstracts*. Amer. Soc. Agron. Minneapolis, MN. p. 265.
- Purves, P.M., W.C. Lindemann, and T.J. Wacek. 1992. An alternative method of applying rhizobium in the field. Abstract. *New Mexico Amer. Soc. for Microbiology*. El Paso, TX.
- Salazar, E.S., W.C. Lindemann, N.B. Christensen, and M. Cardenas. 1992. Efecto de la lambranza y fertilizacion en la mineralizacion del nitrogeno bajo condiciones de laboratorio NMSU y FAZ-UJED. Abstracto. *Sociedad Mexicana de la Ciencia del Suelo 1962-1992*. November 9-14, Acapulco, Mexico. p. 69.

Research Support

W.C. Lindemann	<i>Application of Biotechnology in Management of Industrial Waste Containing Toxic Metals - DOE/WERC</i>	\$38,515 2/91-2/93
W.C. Lindemann B. McCaslin	<i>Bacterial Enhancement of Hyperaccumulators for Remediation of Lead Contaminated Sites - TPL, Inc. (proposal submitted)</i>	\$11,878 3/93-9/93

Donald L. Lindsey

Entomology, Plant Pathology and Weed Science
Agriculture and Home Economics
Box 30003 Dept. 3BE
Phone 646-2638 FAX 646-5975 E-Mail

Interests plant pathology

Research Support

D.L. Lindsey C. Liddell	<i>Control of Phytophthora Root Rot of Chile -NM Chile Commission</i>	\$7,000 7/90-6/91
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Foreign Experience

In August Lindsey will complete his three-year assignment in Egypt as team leader for the National Agricultural Research Project.

Richard L. Long

Chemical Engineering
Engineering
Box 30001 Dept. 3805 Jett Hall 259
Phone 646-1510 FAX 646-4149 E-Mail

Interests transport processes

Publications

- Long, R.L. Jr., I. Tavarez, W. Lin and P. Reimus. 1991. Interfacial area production in tess and jets. Extended Abstracts. AIChE Ann. Mtg. Los Angeles, CA. Paper 120f.
- Nuttall, H.E. and R.L. Long, Jr. 1991. Mobility of radioactive colloid particles in groundwater. WERC-ITV. WERC Research Seminar Series. July 2.

Research Support

R.L. Long H.E. Nuttall (UNM)	<i>Mobility of Radioactive Colloidal Particles in Groundwater - DOE/WERC</i>	\$48,630
R.L. Long	<i>Chemical Hazard Assessment - Argonne National Laboratory</i>	\$174,019
R.L. Long	<i>Lanthamide Separation by Liquid Membrane Extraction - Los Alamos National Laboratory</i>	\$119,000
R.L. Long	<i>Evaluation and Modeling of Mechanical Stirring and Sparge-mixing for Molten Salt Processes - Los Alamos National Laboratory</i>	\$52,113 10/92-9/94

Special Facilities and Holdings

Software: TRACR3D

Norman K. Lownds

Agronomy and Horticulture

Agriculture and Home Economics

Box 30003 Dept. 3Q

Phone 646-3638 FAX 646-6041 E-Mail

Interests water requirements of herbaceous perennials, herbaceous perennials

Publications

- Knoche, M., N.K. Lownds, and M.J. Bukovac. 1992. Factors affecting the absorption of Gibberellin A3 by sour cherry leaves. *Crop Prot.* 11:54-63.
- Lownds, N.K. and M. J. Bukovac. 1992. Studies on octylphenol surfactants: X. effect of oxyethylene chain length on ethylene production by cow pea and mung bean and comparison with linear alcohol hydrophobes. *Plant Growth Reg.* 11:139-145.
- Lownds, N.K. and T. M. Sterling. 1992. Characterization of picloram-induced ethylene production in broom snakeweed and its role in herbicide activity. *Plant Growth Reg. Soc Amer. Quarterly* 20:142.
- Lownds, N.K. 1992. Evaluation of Crabapple Cultivars for Northern New Mexico. Dept. of Agronomy and Horticulture.
- Lownds, N.K. 1992. Practical turf areas: Square peg in a round hole. *Proc. Sixth Texas Xeriscape Conf.* El Paso, TX.
- Morrison, R.G., N.K. Lownds, and T.M. Sterling. 1992. Characterization of picloram uptake, translocation and picloram-induced ethylene production in Russian knapweed. *Proc. West. Soc. Weed Sci.* Salt Lake City, UT. 45:128.

Research Support

N.K. Lownds	<i>Determining Water Requirements for Container Production of Herbaceous Perennials - Perennial Plant Association</i>	\$2,700 11/90-8/91
N.K. Lownds T. Sterling	<i>Picloram Resistance in Yellow Starthistle - University of California</i>	\$36,512 3/92-9/94
N.K. Lownds	<i>Determining Irrigation Requirements of Urban Trees and Shrubs - International Arid Lands Consortium (proposal submitted)</i>	\$29,070 5/94-4/96
T. Sterling N.K. Lownds	<i>Mechanism of Auxin-like Herbicide Resistance and Cross-resistance in Yellow Starthistle - US Department of Agriculture (proposal submitted)</i>	\$163,630 7/94-6/97

Foreign Experience

Lownds is scheduled to attend the International Arid Lands Consortium Workshop in Jerusalem in June.

Leon L. Lundie

Biology

Arts and Sciences

Box 30001 Dept. 3AF Foster Hall 310

Phone 646-3611 FAX 646-5665 E-Mail

Interests anaerobic microbiology, low-cost remediation and treatment technologies, bioreclamation of oil-field produced waters, nickel transport, effects of heavy metals

Publications

Cunningham, D.P. and L.L. Lundie, Jr. 1992. Precipitation of cadmium by *Clostridium thermoaceticum*. *Applied Environ. Biology*. (Submitted).

Lundie, L.L., Jr. 1991. Precipitation of cadmium, lead, and mercury by *Clostridium thermoaceticum*. Ann. Mtg. American Society of Microbiologists. Abstract Q260. p. 319.

Research Support

L.L. Lundie *Development of Low-cost Remediation and Treatment Technologies -* \$160,000
W. Zachritz Environmental Protection Agency 2 yrs

L.L. Lundie *Bioreclamation of Oil-field Produced Waters - WERC* \$20,000
N. Khandan 3/92-3/93

L.L. Lundie *Proteins Involved in the Tolerance of Clostridium Thermoaceticum to* \$600
Cadmium - NMSU A&SRC Minigrant 3/92-2/93

L.L. Lundie *Studies on Nickel Transport and Effects of Heavy Metals on* \$1,000
Acetate-Utilizing Methanogens - NMSU A&SRC Minigrant 10/90-11/91

L.L. Lundie *Purification of Cysteine Desulhydrase from Clostridium Thermoaceticum* \$300,000
and Its Regulation by Cadmium - National Science Foundation (proposal 3 yrs
submitted)

L.L. Lundie *Transport and Tolerance of Nickel by Aceticlastic Methanogens* \$313,236

L.L. Lundie *Characterization of Aerobic and Anaerobic N-alkane Degradation in High* \$24,410
Salinity Waters - NM Water Resources Research Institute (proposal 7/94-6/95
submitted)

Special Facilities and Holdings

Equipment: Anaerobic chamber - useful for isolation/growth of anaerobes and for anaerobic techniques. I am the only anaerobic microbiologist in New Mexico that I know of who works with obligate anaerobes. Availability can be arranged pretty easily.

Gregory H. Mack

Geological Sciences

Arts and Sciences

Box 30001 Dept. 3AB Breland 121

Phone 646-1343 FAX 646-6096 E-Mail

Interests sedimentary petrology, sedimentology, stratigraphy of Rio Grande Rift

Publications

- James, W.C., G.H. Mack and T.W. Grunwald. 1991. Comparison of pedogenic and early diagenetic groundwater calcite, Camp Rice and Palomas formations (Plio-Pleistocene), Rio Grande Rift, southern New Mexico. *Abstract. Geol. Soc. Amer. Abstract Program.* 23:65.
- Mack, G.H., S.L. Salyards and W.C. James. 1993. Magnetostratigraphy of the Plio-Pleistocene Camp Rice and Palomas formations in the Rio Grande Rift of southern New Mexico. *American Journal of Science.* 293:49-77.
- Mack, G.H. and W.C. James. 1993. Control of basin symmetry on fluvial lithofacies, Camp Rice and Palomas formations (Plio-Pleistocene), southern Rio Grande Rift, USA. *International Association of Sedimentologists, Special Publication.* 17:439-449.
- Mack, G.H., W.C. James and H.C. Monger. 1993. Classification of paleosols. *Geological Society of America Bulletin.* 105:129-136.
- Mack, G.H. 1992. Paleosols as an indicator of climate change at the Early-Late Cretaceous boundary, southwestern New Mexico. *Journal of Sedimentary Petrology.* 62:483-494.
- Mack, G.H. and W.C. James. 1992. Calcic paleosols of the Plio-Pleistocene Camp Rice and Palomas formations, southern Rio Grande Rift, USA. *Sedimentary Geology.* 77:89-109.
- Mack, G.H. and W.C. James. 1992. Paleosols for Sedimentologists: Geological Society of America. Short course notes, 127 p.
- Mack, G.H., P.R. Cole, T.H. Giordano, W.C. Schaal, and J.H. Barcelos. 1991. Paleoclimate controls on stable oxygen and carbon isotopes in caliche of the Abo formation (Permian), south-central New Mexico. *J. Geol. Petrol.* 61: 458-472.
- Mack, G.H. and K. Suguio. 1991. Depositional environments of the Yeso formation (middle Permian) southern Caballo Mountains. *New Mexico Geology.* 13:45-47, 59.
- Mack, G.H., S.L. Salyards, and W.C. James. 1991. Magnetostratigraphy of the Camp Rice formation (Plio-Pleistocene) in the southern Rio Grande Rift. *Abstract. Geol. Soc. Amer. Abstracts Program.* 23:45.
- Mack, G.H. and W.R. Seager. 1990. Tectonic control of facies distribution of the Camp Rice and Palomas formations (Pliocene-Pleistocene) in the southern Rio Grande Rift. *Geol. Soc. Amer. Bull.* 102:45-53.
- Mack, G.H. and W.C. James. 1990. Cyclic sedimentation in the mixed siliciclastic-carbonate Abo-Huerco transition zone (lower Permian), southwestern New Mexico. *Carbonate-Siliciclastic Mixtures. Soc. Econ. Paleontologists and Mineralogists.* D.A. Budd and P.M. Harris (eds.). Reprint Series No. 14.
- Mack, G.H., S.L. Salyards, T.H. Giordano, D.R. Cole and W.C. James. 1990. Carbon and oxygen isotopes of caliche as an indicator of late Pliocene to middle Pleistocene paleoclimate in south central New Mexico. *Geol. Soc. Amer. Abstracts with Programs.* 22:354.
- Mack, G.H. and T. Jerzykiewics. 1989. Detrital modes of sand and sandstone derived from andesitic rocks as a paleoclimatic indicator. *Sedimentary Geol.* 65:35-44.
- Molenaar, C.M., G.H. Mack, B.A. Black, and W.A. Cobban. 1990. Stratigraphy and provenance of upper cretaceous rocks in south-central New Mexico. *Amer. Alloc. Petrol. Geol. Bull.* 78:1338.
- Seager, W.R. and G.H. Mack. 1990. Eagle Nest-Granite Hill area, Luna county, NM: A new look at some old rocks. *New Mexico Geol.* 12:1-8.

Research Support

G.H. Mack	<i>Plio-Pleistocene Paleosols and Paleoclimate in the southern Rio Grande Rift</i> - Petroleum Research Fund of American Chemical Society	\$20,000
G.H. Mack	<i>Calcareous Paleosols as an Indicator of Pliocene to Middle Pleistocene Paleoclimatic Changes in Southern New Mexico</i> - American Chemical Society	\$20,000 9/91-8/93

Benjamin N. Matta

Economics

Business Administration and Economics

Box 30001 Dept. 3CQ

Phone 646-2113 FAX 646-1915 E-Mail

Interests labor economics, managerial economics

Foreign Experience

Matta presented a paper entitled "Delivering Medical and Social Services to the HIV Infected Population: The Role of Race" at the Western Economic Association International Meeting held in Vancouver, BC in June 1994.

Harold R. Matteson

Center for International Programs
Box 30001 Dept. 3567
Phone 646-3199 FAX 646-1517 E-Mail

Interests international environmental programs

Research Support

H.R. Matteson	<i>A Systems Approach for Internationalizing Undergraduate Agricultural Curricula - USDA/Cooperative State Research Service</i>	\$63,767 9/93-8/95
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Foreign Experience

Matteson and Miley Gonzalez (Ag and Ext. Education) traveled to Paraguay, Bolivia, Chile, and Honduras in March 1993 to discuss potential opportunities for NMSU faculty involvement in programs of mutual interest in agriculture, natural resources and environmental areas.

Matteson along with R. Jacquez, R. Schoenmackers, Eldon Stealman and Jim Maes and J. Burns, in February 1993, traveled to Univ. Nac. Autonoma de Mexico to discuss mutual interest in space, astronomy, energy, and the environment.

Matteson along with D. Matthews, J. Waelti, and J. Kemp traveled to Moscow and Kazakhstan in February 1994 to initiate cooperation in the areas of agriculture, natural resources, and the environment.

Matteson traveled to Egypt and Yemen to obtain information regarding two World Bank agricultural projects in Egypt and a community college project in Yemen.

Matteson along with W. Zachritz and T. Ward traveled to Santa Catarina, Brazil to provide assistance to the Fundacao Educacional de Criciuma in the area of environmental contamination due to coal mining.

Matteson traveled to Dominica and Barbados in January 1994 on an administrative visit.

Charlotte M. McCarthy

Biology
Arts and Sciences
Box 30001 Dept. 3AF Foster Hall 306
Phone 646-3926 FAX 646-5665 E-Mail

Interests medical microbiology, waterborne pathogens: detection, identification, quantitation, microbial physiology, particularly growth regulation

Publications

Abdulmalek, S. and C.M. McCarthy. 1994. Resistance and permeability of *Mycobacterium avium* complex to 5-fluorouracil. *Journal of Antimicrobial Chemotherapy*. 33:329-335.

Abdulmalek, S., D.P. Montoya and C.M. McCarthy. 1993. Incorporation of 5-fluorouracil into RNA by *Mycobacterium avium* complex strain LM1. *Canadian Journal of Microbiology*. 39:616-622.

Naser, S.A., C.M. McCarthy, G.B. Smith and A.K. Tupponce. 1993. Low temperature protocol for efficient transformation of *Mycobacterium smegmatis* spheroplasts. *Current Microbiology*. 27:153-156.

Terauds, V.I., G. Contaldo, C.M. McCarthy, and G.B. Smith. 1993. Field and laboratory evidence for in situ biotransformation of isopropanol and Freon-11. *Ground Water*. 31:850-851.

Research Support

C.M. McCarthy S. Naser	<i>Molecular Characterization of Unusual Plasmid in <i>Mycobacterium smegmatis</i></i>
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C.M. McCarthy *Molecular Characterization of Cryptic Plasmid of Mycobacterium*
S. Naser *Intracellulare*

C.M. McCarthy *Quantitation of Aerobic and Anaerobic Bacteria in Groundwater*
G. Smith
H+GLC (geologic
consulting firm)

C.M. McCarthy *Dehalogenase of Pathogenic Mycobacteria*

Foreign Experience

Current research on detection and quantitation of *Vibrio cholerae* in water, with a Brazilian firm.

Related Team Efforts

Quantitation of aerobic and anaerobic bacteria in groundwater on White Sands Missile Range. Collaborators: G. Smith, H&GLC (a geologic consulting firm), and NASA.

Special Facilities and Holdings

Facilities: two biosafety level II laboratories with teaching and research culture collections of about 300 different bacterial strains, most are pathogens

Equipment: two standard microbiology laboratories

Bobby D. McCaslin

Agronomy and Horticulture
Agriculture and Home Economics
Box 30003 Dept. 3Q
Phone 646-2324 FAX 646-6041 E-Mail

Interests soil fertility

Publications

McCaslin, B.D. 1992. Final Report to Department of Naval Research in Cooperation with TPL Corporation on Military Munitions Utilization as N-Fertilizer.

Research Support

B.D. McCaslin	<i>Soil, Water, Air Testing Laboratory (SWAT) - DOE/WERC</i>	\$147,520 2/90-2/91
B.D. McCaslin	<i>Munitions as Fertilizer - TPL, Inc.</i>	\$15,000 10/93-10/94
W. Lindemann B.D. McCaslin	<i>Bacterial Enhancement of Hyperaccumulators for Remediation of Lead Contaminated Sites - TPL, Inc. (proposal submitted)</i>	\$11,878 3/93-9/93

Kirk C. McDaniel

Animal and Range Sciences
Agriculture and Home Economics
Box 30003 Dept. 3-I
Phone 646-1191 FAX 646-5441 E-Mail

Interests surface conservation, groundwater conservation

Publications

- McDaniel, K.C., D.L. Anderson, and J.F. Balliette. 1992. Wyoming big sagebrush control with metsulfuron and 2,4-D in northern New Mexico. *Journal of Range Management*. 44:619-621.
- McDaniel, K.C., D.L. Anderson, and L.A. Torell. 1992. Vegetation change following big sagebrush control with tebuthiuron. NMSU Agricultural Experiment Station Bulletin 764.
- McDaniel, K. C., L.A. Torell, and J.W. Bain. 1992. Overstory-understory relationship for a short-lived perennial weed (*Gutierrezia sarothrae*) growing on shortgrass prairie in New Mexico, USA. *Proceedings of the First International Weed Control Congress*. Monash University, Melbourne, Australia. 2:17-21.
- McDaniel, K.C. and C.P. Hart. 1992. Fuel and environmental characteristics related to fire intensity in the shortgrass prairie. *Society of Range Management*. 45.
- McDaniel, K.C. and P.N. Berry. 1992. Influence of available soil moisture on the ability of snakeweed seedlings to propagate and survive. *Society of Range Management*. 45.

Foreign Experience

McDaniel traveled to London in June 1994 to learn state-of-the-art pesticide application technology practiced at British universities and chemical companies.

J. T. McGuckin

Economics
Business Administration and Economics
Box 30001 Dept. 3CQ
Phone 646-2113 FAX 646-1915 E-Mail

Interests production economics, resource economics and policy

Research Support

J.T. McGuckin	<i>Assessing Risks for Nuclear Waste Transportation - DOE/WERC</i>	\$71,356
D. Gegax		3/90-2/93

Timothy I. McKimmie

Library
Box 30006 Dept. 3475 Library
Phone 646-7483 FAX 646-4335 E-Mail tmckimmi@lib.nmsu.edu

Interests environment, species diversity, biology, agriculture, sustainable development

Publications

- McKimmie, T.I. 1992. Budgeting for CD-ROM in academic libraries: Sources and impacts. *Library Acquis.: Practice and Theory*. 16:2:221-227.
- McKimmie, T.I. 1991. Review of A World List of Mammalian Species by G.B. Corbet and J.E. Hill. *Choice*. 29:3:412.
- McKimmie, T.I. and A.K. Dobrenz. 1991. Ionic concentrations and water relations of alfalfa seedlings differing in salt tolerance. *Agron. J.* 83:363-367.

Research Support

T.I. McKimmie	<i>Endangered Species (Plants) Survey in Cooperation with the Nature Conservancy and the New Mexico Energy, Minerals and Natural Resources Department</i>
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Related Team Efforts

Contributor to and supporter of the Southwest Environmental Center which seeks to increase awareness of the local urban environment in order to build a connection with other environmental issues.

Special Facilities and Holdings

Bibliographies: Sources of Information on Environmental Issues by Tim McKimmie. 1993
Sources of Information in Agricultural Sciences. 1992
How to Do Library Research in Geology. 1993

Nancy J. McMillan

Geological Sciences

Arts and Sciences

Box 30001 Dept. 3AB Breland 120

Phone 646-5000 FAX 646-6096 E-Mail

Interests igneous petrology, volcanic processes, volcanic rocks, analytical geochemistry

Publications

- Davidson, J.P., N.J. McMillan, S. Moorbath, G. Worner and R.S. Harmon. 1990. The Nevados de Payachata volcanic region (18.S/69-W N. Chile) II. Evidence for widespread crustal involvement in Andean magmatism. *Contributions to Mineralogy and Petrology*. 105:412-432.
- Haag, D.M. and N.J. McMillan. 1990. Geochemistry of late Oligocene to early Pleistocene basalts of southern New Mexico. Geological Society of American National Meeting. Dallas, TX.
- Lopez-Escobar, L., G. Worner, N.J. McMillan, J. Davidson, S. Moorbath and R.S. Harmon. 1991. Contribucion al conocimiento geologico, goquimico y petrologica del volcanismo, post Mioceno Media, de la region de los Nevados de Payachata, Andes Centrales, 1800'S - 1830'S. *Revista Geologica de Chile*.
- McMillan, N.J., J.P. Davidson, G. Worner, R.S. Harmon, S. Moorbath and L. Lopez-Escobar. 1993. Influence of crustal thickening on arc magnetism: The Nevados de Payachata volcanic region, northern Chile. *Geology*. 21:467-470.
- McMillan, N.J., K.C. Cameron, and A.P. Dickin. 1992. Did the protoliths of Kilbourne Hole mafic granulite xenoliths crystallize from tertiary magmas? *Eos*. 73:658.
- McMillan, N.J., A.P. Dickin, and C. Skuba. 1992. Pb-Sr-Nd isotopic constraints on cenozoic mantle and crustal magma sources, southern New Mexico. *Eos*. 73:338.
- McMillan, N.J., D.M. Haag and A.P. Dickin. 1991. Tertiary lithosphere evolution in southern New Mexico: Preliminary conclusions. Geological Society of America Rocky Mountain - South Central Regional Meeting. Albuquerque, NM.
- McMillan, N.J. and A.P. Dickin. 1991. Magma production during tectonic transition: Development of the Rio Grande Rift in southern New Mexico. *Eos*. 72:560.
- McMillan, N.J. and A.P. Dickin. 1990. The Uvas basaltic andesite, southern New Mexico: Magmagenesis during initial Rio Grande Rift extension. Geological Society of America National Meeting. Dallas, TX.

Research Support

N.J. McMillan	<i>Tertiary Evolution of the North American Continental Lithosphere during the Transition from Subduction to Rifting: The Magmatic Record in Southern New Mexico</i> - National Science Foundation	\$70,000 2 yrs
N.J. McMillan	<i>Continental Lithosphere Evolution as a Function of Tectonic Environment: Chemical and Temporal Variations</i> - Institute of Geophysics and Planetary Physics, Los Alamos National Laboratory	\$26,000 2 yrs
N.J. McMillan	<i>Stratigraphy and Geochemistry of the Uvas Volcanic Field, Southern New Mexico</i> - NM Bureau of Mines and Mineral Resources	\$1,000 1991
N.J. McMillan	<i>Collaborative Petrological, Geochemical, and Isotopic Investigation of Late Cenozoic Volcanism in the Andes of Chile</i> - National Science Foundation	\$69,000 3 yrs
N.J. McMillan	<i>Continental Lithosphere Evolution as a Function of Tectonic Environment: Chemical and Temporal Variations</i> - Los Alamos National Laboratory	\$14,000 1/91-9/92

John G. Mexal

Agronomy and Horticulture

Agriculture and Home Economics

Box 30003 Dept. 3Q Gerald Thomas 103

Phone 646-3335 FAX 646-6041 E-Mail

Interests nursery and forest crops**Publications**Briede, J.W., J.G. Mexal, A.M. Lynch, and F.G. Hawksworth. 1991. Shoot growth and development of Douglas-fir and white fir in New Mexico. *Proc. Interior Douglas-Fir. The Species and Its Management*. Spokane, WA. pp. 155-159.Clevenger, T. J.G. Mexal, and D.J. Cotter. 1990. A model of specialty crop diversification. *Agricultural Diversification: Policies and Strategies. Proc. 19th West Indies Agric. Econ. Conf.* C.A. Premberton (ed.). Univ. of West Indies Press. pp. 55-61.Fisher, J.T. and J.G. Mexal. 1990. Risk management in Christmas tree establishment in the southwest. *Amer. Christmas Tree J.* 18:8-12.Mexal, J.G. 1992. Artificial regeneration of shortleaf pine. Put It All Together for Success. *Proc. Shortleaf Pine Regeneration Workshop*. USDA For. Serv. Gen. Tech. Rep. SO-90. Little Rock, AR. pp. 172-182.Mexal, J.G. and J.T. Fisher. 1991. Killing landscape trees: A New Mexico tradition. *Southwest Lawn and Landscape*. 6:10:16.**Research Support**

J.G. Mexal	<i>Mycorrhizal Inoculation of Nursery Crops - MycorrTech Small Business Innovative Research Forest Nursery Training</i>	
J.G. Mexal	<i>Consortium Agreement: Research, Development, and Application Program for Management of National Forest in the Southwest - Northern Arizona University</i>	\$111,530 9/92-2/94
J.G. Mexal	<i>Forest Nursery Training AID/Cochren Program</i>	
R. Phillips J. Mexal P. Huntsberger	<i>Tropical Forestry Initiative - International Forestry Grant with Mexico - USDA Forest Service</i>	\$125,000 1/94-12/94
J.G. Mexal L. Matthews T. Sammis	<i>Increasing Scientist Diversity in Agriculture and Natural Resources - US Department of Education (proposal submitted)</i>	\$92,001 1/94-12/96

Foreign Experience

Mexal along with R. Phillips, J. Fisher, R. Neumann and P. Huntsberger have received an \$125,000 grant from the US Forest Service International Division to conduct a forest nursery course in Hidalgo, Mexico. They are scheduled to conduct a one month Forest Nursery Training Program in Hidalgo this summer.

Mexal and R. Phillips are cooperating with the Milburn Foundation on the submission of a proposal to the Biodiversity Support Program, World Wildlife Fund. The proposal is to provide forestry nurseries and reforestation training for the Tarahumara Indian's Arareco Nursery in Chihuahua, Mexico. (9/2/92)

Mexal coordinated a short-course (along with R. Phillips, J. Fisher and P. Huntsberger) on Forest Nursery Production and Seedling Establishment Field Tour for participants from Mexico and other countries.

Related Team Efforts

Southwest Forest Initiative - Region Intermountain Nursery Association

August Miller
Physics (retired)
Arts and Sciences
Box 30001 Dept. 3D Gardiner 202
Phone 646-3428 FAX 646-1934 E-Mail amiller@nmsu.edu

Interests molecular and atmospheric optics, mainly radiative transfer at IR wavelengths, modeling thermal emission properties of clouds and cloud microphysics as related to cloud seeding

Research Support

A. Miller	<i>ASL/EOSAEL Radiative Transfer Methods Validation</i> - Physical Science Laboratory	\$19,100 1/90-9/90
A. Miller	<i>Radiative Effects Modeling</i> - Science and Technology Corporation	\$14,000 3/92-12/92

H. C. Monger
Agronomy and Horticulture
Agriculture and Home Economics
Box 30003 Dept. 3Q Gerald Thomas 208
Phone 646-1910 FAX 646-6041 E-Mail

Interests natural cycles of climate change and soil geomorphic responses to climate change, desert soil mineralogy and isotope geochemistry, soils, land use and the environment, site selection for long-term waste disposal

Publications

Khresat, S.A. and H.C. Monger. 1992. Soils and geomorphology of an intermontane basin near Orogrande, New Mexico. *Agron. Abstracts. Amer. Soc. Agron. Madison, WI.* p. 305.

Monger, H.C., D.R. Cole, and J.W. Gish. 1992. Late quaternary paleosols and climate change in southern New Mexico. *Geological Soc. Amer. Abs. with Program.* 8043:24.

Monger, H.C., D.R. Cole, and J.W. Gish. 1992. Evidence of holocene climate change in New Mexico based on stable isotopes and fossil pollen in buried soils. *Agron. Abstracts. Amer. Soc. Agron. Madison, WI.* p. 309.

Monger, H.C., L.A. Daugherty, and L.H. Gile. 1991. A microscopic examination of pedogenic calcite in an aridisol of southern New Mexico. Occurrence, Characteristics and Genesis of Carbonate, Gypsum and Silica Accumulation in Soils. *Soil Science Society of America. SSSA Special Publication No. 26.* (available from NMWRRRI office, 646-1195)

Monger, H.C. and L.A. Daugherty. 1991. Pressure solution: Possible mechanism for silicate grain dissolution in a petrocalcic horizon. *Soil Sci. Soc. of Amer. J.* 55:6:1625-1629. (available from NMWRRRI office, 646-1195)

Monger, H.C. and L.A. Daugherty. 1991. Neof ormation of palygorskite in a southern New Mexico aridisol. *Soil Sci. Soc. of Amer. J.* 55:6:1646-1650. (available from NMWRRRI, 646-1195)

Monger, H.C., L.A. Daugherty, W.C. Lindemann, and C.M. Liddell. 1991. Microbial precipitation of pedogenic calcite. 19:997-1000.

Research Support

H.C. Monger D. Cole (Oak Ridge National Lab)	<i>Ft. Bliss Geomorphic Project</i> (purpose is to investigate climate change and desertification during late Pleistocene and Holocene) - Department of Defense	\$174,000 2 yrs
H.C. Monger	<i>LTER Soil-Geomorphic Project</i> (beginning detailed soil-geomorphic mapping summer 1992 using a student funded by NSF - plan to expand study to look at paleoenvironmental change by summer 1993)	
H.C. Monger L. Daugherty	<i>Description and Interpretation of Characteristics on the Ft. Bliss Reservation, TX</i> - Human Systems Research, Inc.	\$174,240 10/90-10/92

Related Team Efforts

Soil-geomorphic research on climate change is for archaeologists employed by Dept. of Defense at Ft. Bliss.

Special Facilities and Holdings

Facilities: Ft. Bliss Military Reservation Jornada Long-Term Ecological Research Site
Equipment: cathodoluminescence attached to Nikon microscope (available)
Bibliographies: desert soil mineralogy; geomorphology; quaternary climate change in southern New Mexico (available)
Datasets: clay mineralogy data for Las Cruces vicinity (available); archaeological data for Ft. Bliss Military Reservation
Other: thin sections of desert soils in southern New Mexico (available)

Jerry E. Mueller

Geography

Arts and Sciences

Box 30001 Dept. MAP Breland 102

Phone 646-1045 FAX 646-6096 E-Mail

Interests fluvial geomorphology, environmental geomorphology, cartography

Publications

Mueller, J.E. 1991. Climate of Cloudcroft-Ruidoso country. Geology of the Sierra Blanco, Sacramento and Capitan Ranges, New Mexico. *New Mexico Geological Society Guidebook 42*. Socorro, NM. pp. 2-3.

Mueller, J.E. and G.J. Contaldo. 1991. Earth fissures of the Mimbres Basin, southwestern New Mexico. *New Mexico Geology*. pp. 69-74.

Mueller, J.E. and G.J. Contaldo. 1991. Earth fissures and land subsidence of the Mimbres Basin, southwestern New Mexico, USA. Land Subsidence. *International Association of Hydrological Studies Publication No. 200*. A.I. Johnson (ed.). Oxford. pp. 301-310.

Research Support

J.E. Mueller	<i>Intergovernmental Personnel Assignment Agreement - DOD/Army</i>	\$88,975 8/93-5/94
J.E. Mueller	<i>Analysis of Climate Interaction and Desertification Processes in SW Deserts of the US Using Remote Sensing and GIS - University of Nevada System</i>	\$13,525 6/93-5/94
A. Peters J.E. Mueller	<i>Analysis of Climate Interaction and Desertification Processes in SW Deserts of the US Using Remote Sensing and GIS - Environmental Protection Agency (proposal submitted)</i>	\$142,835 8/93-8/95

Foreign Experience

Visiting geomorphologist, Department of Geography, University of Queensland, Queensland, Australia, and University of Adelaide, South Australia, 1983.

Wolfgang Mueller

Chemistry and Biochemistry

Arts and Sciences

Box 30001 Dept. 4500

Phone 646-1823 FAX 646-2649 E-Mail

Interests bioremediation of organic waste

Research Support

W. Mueller	<i>Biodegradation of Explosive Wastes- DOE/WERC</i>	\$42,863 3/90-12/90
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W. Mueller G. Bedell	<i>Biodegradation of Explosives - DOE/WERC</i>	\$141,132 1/90-2/93
R. Berghage W. Mueller W. Zachritz	<i>Agricultural Wastewater Remediation Using Artificial Wetlands Filters - USDA/Cooperative State Research Service (proposal submitted)</i>	\$125,799 7/93-8/95

Stuart Munson-McGee

Chemical Engineering
Engineering

Box 30001 Dept. 3805 Jett Hall 251
Phone 646-6439 FAX 646-4149 E-Mail smcgee@nmsu.edu

Interests hazardous waste management, composite materials, materials manufacturing

Research Support

S. Munson-McGee S. Holbrook	<i>Encapsulation of Radioactive Wastes - Los Alamos National Laboratory</i>	
S. Munson-McGee	<i>Liners for MSW Landfills - currently unfunded</i>	
S. Munson-McGee	<i>Analysis of 24 Stabilized Blocks for Comprehensive Strength - Versar, Inc.</i>	\$944 1/92-1/92
S. Munson-McGee	<i>Improved Encapsulation of Hazardous Wastes Using the Tide Process - DOE/WERC</i>	\$39,585 2/92-2/94
S. Munson-McGee	<i>High-power Ultrasonic-vibration Processing of Ceramic Powders and Ceramic-matrix Composites - DOD/Strategic Defense Initiative Organization (proposal submitted)</i>	\$299,636 7/93-6/95

Mary A. O'Connell

Agronomy and Horticulture
Agriculture and Home Economics

Box 30003 Dept. 3Q Gerald Thomas 179
Phone 646-5172 FAX 646-6041 E-Mail

Interests genetic engineering for water-use efficiency and drought tolerance, plant-mediated bioremediation of explosive wastes, molecular biology

Publications

- Bonnema, A.B., J.M. Melzer, L.W. Murray, and M.A. O'Connell. 1992. Non-random inheritance of organellar genomes in symmetric and asymmetric somatic hybrids between *Lycopersicon esculentum* and *L. pennellii*. *Theor. Appl. Genet.* 84:435-442.
- Bonnema, A.B., J.M. Melzer, and M.A. O'Connell. 1991. Tomato cybrids with mitochondrial DNA from *L. pennellii*. *Theor. Appl. Genet.* 81:339-348.
- Bray, E.A., T.L. Kahn, S.E. Fender, and M.A. O'Connell. 1992. Expression of drought and ABA induced genes in drought tolerant tomatoes. *Seventh Ann. Symposium Southwest Consortium of Plant Genetics and Water Resources*. November 7-8, Lubbock, TX. p. 11.
- Fender, S.E. and M.A. O'Connell. 1990. Expression of the heat shock response in a tomato interspecific hybrid is not intermediate between the two parental responses. *Plant Physiol.* 93:1140-1146.
- Kahn, T.L., S.E. Fender, E.A. Bray and M.A. O'Connell. 1993. Characterization of expression of drought- and abscisic acid-regulated tomato genes in the drought-resistant species *Lycopersicon pennellii*. *Plant Physiology.* 103:597-605.

- Melzer, J.M. and M.A. O'Connell. 1992. Effect of radiation dose on the production of and the extent of asymmetry in tomato asymmetric somatic hybrids. *Theor. Appl. Genet.* 83:337-344.
- O'Connell, M.A. 1993. Heat shock proteins and thermotolerance. *Stress-induced Gene Expression in Plants*. A.S. Bassa (ed.). Harwood Acad. Pub., Reading, PA. pp. 163-183.
- Wei, T., M. Trevino, and M.A. O'Connell. 1992. Sequence analysis of two drought and ABA induced genes in the drought tolerant species *Lycopersicon pennellii*. *Seventh Ann. Symposium Southwest Consortium on Plant Genetics and Water Resources*. November 7-7, Lubbock, TX. p. 25.

Research Support

M.A. O'Connell E.A. Bray (UC/Riverside)	<i>Expression in Drought and ABA-Induced Genes in Drought Tolerant Tomatoes</i> - USDA Southwest Consortium on Plant Genetics and Water Resources	\$131,200 1990-93
M.A. O'Connell	<i>A Mitochondrial Mutation in Tomato Alters Vegetative and Reproductive Growth</i> - US Department of Agriculture	\$82,000 9/91-9/94
M.A. O'Connell	<i>Construction and Characterization of Tomato Somatic Hybrids and Cybrids</i> - NIH, Minority Biomedical Research Service training grant	\$109,752 1991-95
M.A. O'Connell	<i>Minority High School Student Research Apprentice Program</i> - DHHS/NIH	\$30,000 3/93-2/94
M.A. O'Connell	<i>Minority High School Student Research Apprenticeship Program</i> - DHHS/NIH	\$21,000 3/94-2/95
J. Kemp M.A. O'Connell	<i>Chile Biotechnology</i> - USDA Southwest Consortium on Plant Genetics and Water Resources	\$88,000 7/92-6/94

Related Team Efforts

National Level: Southwest Consortium on Plant Genetics and Water Resources. Through this consortium, I have collaborated on funded research projects with colleagues at Univ. of Ariz., Univ. of CA/Riverside and Texas Tech.

State Level: Collaborated with Dr. Paul Jackson at Los Alamos National Lab on a funded project to use plants to bioremediate a TNT contaminated site at LANL. In this same vein, I have collaborated with Drs. Mueller and Bidell of the Toxicology Program at NMSU, Dr. Sterling of EPWS at NMSU and Dr. Jackson at LANL, and written grants to fund research on plant-mediated bioremediation of explosive wastes.

Foreign Experience

O'Connell will travel to Amsterdam in June 1994 to present a paper at the Tomato Molecular Biology Symposium.

Special Facilities and Holdings

Equipment: standard molecular and cellular biological laboratory equipment
 Other: genomic clones for drought induced genes in a drought tolerant plant; clone bank of tomato mitochondrial genome and chloroplast genome

Ron W. Parker

Cooperative Extension

Agriculture and Home Economics

Box 30001 Dept. 3AE Knox Hall 230

Phone 646-1709 FAX 646-5441 E-Mail

Interests livestock production, natural resources management

James T. Peach

Economics

Business Administration and Economics

Box 30001 Dept. 3CQ

Phone 646-3113 FAX 646-1915 E-Mail

Interests quantitative economics, border studies, economic development**Publications**Waelti, J.J. and J.T. Peach. 1992. Out of recession and into a prosperous 21st century: What it takes. *Choice*, Third Quarter. pp. 4-7.**Foreign Experience**

Peach has experience in Bangladesh from 1977-78; Mexico at various times.

Special Facilities and Holdings

Datasets: demographic data, US and Mexico

Albert J. Peters

Geography

Arts and Sciences

Box 30001 Dept. MAP Breland 103

Phone 646-3509 FAX 646-6096 E-Mail

Interests remote sensing, geographic information systems, Pecos River vegetation, digital mapping**Publications**Peters, A.J., B.C. Reed, M.D. Eve, and K.C. McDaniel. 1992. Remote sensing of broom snakeweed (*Gutierrezia sarothrae*) with NOAA-10 spectral image processing. *Weed Tech.* 6.**Research Support**

A.J. Peters	<i>Pecos River Vegetation Change Analysis</i> - Soil Conservation Service and NMSU	
J. Brown		
R. Pieper		
A.J. Peters	<i>Battlefield Aerosol Transportation</i> - Physical Science Laboratory	\$6,500 6/91-12/91
A.J. Peters	<i>Analysis of Climate Interaction and Desertification Processes in SW Deserts of the US Using Remote Sensing and GIS</i> - University of Nevada System	\$13,525 6/93-5/94
J. Mueller		
A.J. Peters	<i>Analysis of Climate Interaction and Desertification Processes in SW Deserts of the US Using Remote Sensing and GIS</i> - Environmental Protection Agency (proposal submitted)	\$142,835 8/93-8/95
J. Mueller		

Special Facilities and Holdings

Facilities: Digital Mapping Laboratory housed in Department of Geography

Equipment: nine 386 PCs

Datasets: extensive digital satellite data

Software: image processing and geographic information system software including Erdas and ArcInfo

Gregory C. Phillips

Agronomy and Horticulture

Agriculture and Home Economics

Box 30003 Dept. 3Q Gerald Thomas 182

Phone 646-5113 FAX 646-6041 E-Mail

Interests tissue culture and cell selection for water use efficiency in plants, genetic engineering for tolerance to environmental stresses in crop plants, propagation and conservation of endangered cacti

Publications

- Bagga, S., A. Dharma, G.C. Phillips, and G.D. Kuehn. 1991. Evidence for the occurrence of polyamine oxidase in the dicotyledonous plant *Medicago sativa* L. (alfalfa). *Plant Cell Rep.* 10:550-554.
- Cheng, M., D.C.H. Hsi, and G.C. Phillips. 1992. In vitro regeneration of valencia-type peanut (*Arachis hypogaea* L.) from cultured petioles, epicotyl sections and other seedling explants. *Peanut Sci.* 19:82-87.
- Hubstenberger, J.F., P.W. Clayton, and G.C. Phillips. 1992. Micropropagation of cacti (Cactaceae). *Biotechnology in Agriculture and Forestry. High-Tech and Micropropagation IV.* Y.P.S. Bajaj (ed.). Springer-Verlag: Heidelberg. 20:49-68.
- Liu, W., D.F. Hildebrand, W.S. Grayburn, G.C. Phillips, and G.B. Collins. 1991. Effects of exogenous auxins on expression of lipoxygenases in cultured soybean embryos. *Plant Physiol.* 97:969-976.
- Ludwig, A.D., J.F. Hubstenberger, G.C. Phillips, and G.M. Southward. 1992. Screening of allium tester lines in vitro with *Pyrenochaeta terrestris* filtrates. *Hortsci.* 27:166-168.
- Phillips, G.C. 1993. Micropropagation of rare and endangered cacti. *Applications and Prospects of Biotechnology for Arid and Semi-arid Lands.* T.J. Mabry, H. Nguyen and R.A. Dixon (eds.). IC2 Institute, Univ. of Texas, Austin. pp. 135-152.
- Phillips, G.C., J.W. Grosser, S. Berger, N.L. Taylor, and G.B. Collins. 1992. Interspecific hybridization between red clover and *Trifolium alpestre* using in vitro embryo rescue. *Crop Sci.* 32:1113-1115.
- Phillips, G.C., B.C. Eggett, and G.B. Collins. 1992. Effects of polyamine metabolic inhibitors on growth and alkaloid accumulation in tobacco callus cultures. *Tobacco Sci.* 36:1-5.
- Phillips, G.C. and G.D. Kuehn. 1991. Uncommon polyamines in plants and other organisms. *Biochemistry and Physiology of Polyamines in Plants.* R.D. Slocum and H.E. Flores (eds.). CRC Uniscience, Boca Raton, FL. pp. 121-136.
- Phillips, G.C. and H.J. Gladfelter. 1991. Eldarica pine, Afghan pine (*Pinus eldarica* Medw.). *Biotechnology in Agriculture and Forestry. Trees III.* Y.P.S. Bajaj (ed.). Springer-Verlag: Heidelberg. 15:269-287.
- Woods, S.H., G.C. Phillips, J.E. Woods, and G.B. Collins. 1992. Somatic embryogenesis and plant regeneration from zygotic embryo explants in Mexican weeping bamboo. *Plant Cell Rep.* 11:257-261.

Research Support

G.C. Phillips	<i>Tissue Culture and Cell Genetics in Crop Improvement for Semiarid Lands Agriculture - NM Agricultural Experiment Station/Hatch</i>	\$14,500/yr
G.C. Phillips G.D. Kuehn	<i>Drought-stress Regulated Genes for Polyamine Biosynthesis - USDA Southwest Consortium on Plant Genetics and Water Resources</i>	\$45,000 1991-93
G.C. Phillips G.D. Kuehn	<i>Somatic Cell Selection to Genetically Improve Plant Water Use Efficiency and Tolerance to Stresses</i> (this project includes cell selections in alfalfa and cotton aimed at altering polyamine biosynthesis and adaptation to water-deficit and heat stresses) - NM Water Resources Research Institute/US Geological Survey	\$75,000 3 yrs
G.C. Phillips G. Kuehn	<i>Polyamine Analyses in Maize Cell Cultures and Plants - Pioneer Hi-Bred International, Inc.</i>	\$12,495 10/92-11/94
G.C. Phillips G. Kuehn S. Bagga	<i>Isolation of Genes Coding for Plant Polyamine Biosynthetic Enzymes - US Department of Agriculture</i>	\$110,000 9/93-9/95
G.C. Phillips	<i>Biodegradation of Trihalomethanes (THMs) and Halogenated Aliphatic Compounds by Groundwater Bacteria - NM Water Resources Research Institute (proposal submitted)</i>	\$25,000 7/94-6/95

Related Team Efforts

USDA Southwest Consortium on Plant Genetics and Water Resources; regional consortium of NMSU, Los Alamos National Lab, Texas Tech University, University of Arizona and UC/Riverside. Phillips has been associated as a consultant and/or as a funded investigator by this consortium since its inception.

Special Facilities and Holdings

Equipment: complete laboratory outfitted for plant cell, tissue and organ culture research (unique in state, rare in region)
Other: cotton cell lines adapted to high temperature; alfalfa cell lines adapted to water-deficit stress; cotton, alfalfa and tobacco cell lines resistant to inhibitors of polyamine biosynthetic enzymes

Rex D. Pieper

Animal and Range Sciences

Agriculture and Home Economics

Box 30003 Dept. 3-I Knox Hall 316

Phone 646-4435 FAX 646-5441 E-Mail

Interests plant ecology, grazed and protected ranges, vegetation, grazing on wooded rangelands, grazing on pinyon-juniper rangeland, cholla cactus and blue grama, grassland ecosystem, broom snakeweed, antelope

Publications

- Barnitz, J.A., V.W. Howard, R.D. Pieper, and G.M. Southward. 1990. Vegetational changes following two-way cabling of pinon-juniper in south-central New Mexico. *NMSU Ag. Exp. Stat. Bulletin No. 749*.
- Haque, Z., K.A. Younga, C. McDaniel, and R.D. Pieper. 1991. Two-phase pattern in mesquite-herbland in southern New Mexico. *Southwest Natur.* 36:54-59.
- Holechek, J.L. and R.D. Pieper. 1992. Evaluation of stocking rate procedures for New Mexico ranges. *J. Soil and Water Conservation.* 47:116-119.
- Howard, V.W., J.L. Holechek, R.D. Pieper, K. Green-Hammond, M. Cardenas and S.L. Beasom. 1990. Habitat requirements for pronghorn on rangeland impacted by livestock and net wire in east-central New Mexico. *NMSU Ag. Exp. Stat. Bulletin No. 750*.
- Hulet, C.V., D.M. Anderson, V.D. Nakamatsu, L.W. Murray, and R.D. Pieper. 1992. Diet selection of cattle and bonded small ruminants grazing arid rangeland. *Sheep Research J.* 8:11-18.
- Pamo, E., R.D. Pieper, and R.F. Beck. 1991. Range condition analysis: Comparison of two methods in southern New Mexico desert grasslands. *J. Range Mgmt.* 44:374-378.
- Pamo, E. and R.D. Pieper. 1990. Effects of nitrogen fertilization in combination with potassium and phosphorus and cutting frequency on the yield of *Brachiaria ruziensis* in Adamawa, Cameroon. *Proc. of the Seventeenth Int'l Grasslands Congress.* pp. 111-112.
- Pieper, R.D., E.E. Parker, G.B. Donart, J.D. Wallace and J.D. Wright. 1992. Cattle and vegetational response to four-pasture and continuous grazing systems. *NMSU Ag. Exp. Stat. Bulletin No. 756*.
- Pieper, R.D., B.K. Wylie, and G.M. Southward. 1992. Estimating herbage standing crop from rainfall data in Niger. *J. Range Mgmt.* 45:3:277-284.
- Pieper, R.D., B.K. Wylie, J.A. Harrington, and I. Denda. 1992. A satellite-based range assessment system for the Sahel of Africa. *Geocarta.* 7:79-85.
- Pieper, R.D., T. Wansi, R.F. Beck, and L.W. Murray. 1992. Botanical content of black-tailed jackrabbit diets on semiarid rangeland. *Great Basin Natur.* 52:1-9.
- Pieper, R.D. and R.N. Harrington. 1992. The use of remote sensing and geographical information systems for rangeland inventory in central New Mexico. *Soc. Range Mgmt.* 45:P044.
- Pieper, R.D. 1992. Species composition of woodland communities in the southwest. *Ecology and Management of Oak and Associated Woodlands.* US Forest Serv. Gen. Tech. Rep. RM-218.
- Pieper, R.D. and R.D. Wittie. 1990. Fire effects in southwestern chaparral and pinon-juniper vegetation. *Effects of Fire Management of Southwestern Natural Resources, Proceedings of the Symposium.* U.S. Forest Service General Technical Report RM-191.
- Pieper, R.D. and K.C. McDaniel. 1990. Ecology and management of broom snakeweed. *Snakeweed: Problems and Perspectives.* E.W. Huddleston and R.D. Pieper (eds.). *NMSU Ag. Exp. Stat. Bulletin No. 751*.
- Pieper, R.D. 1990. Snakeweed content of herbivore diets. *Snakeweed: Problems and Perspectives.* E.W. Huddleston and R.D. Pieper (eds.). *NMSU Ag. Exp. Stat. Bulletin No. 751*.

- Pieper, R.D. 1990. Overstory-understory relations in pinon-juniper woodlands in New Mexico. *J. Range Mgmt.* 43:413-415.
- Pieper, R.D. and R.F. Beck. 1990. Range condition from an ecological perspective: Modifications to meet multiple use objectives. *J. Range Mgmt.* 43:550-552.
- White, M.R., R.D. Pieper, G.B. Donart, and L. White Trifaro. 1991. Vegetational response to short-duration and continuous grazing in south-central New Mexico. *J. Range Mgmt.* 44:399-403.

Research Support

R.D. Pieper	<i>Develop an Ecological Classification Procedure for Ponderosa Pine -</i> USDA/Forest Service	\$28,000 2/92-1/95
R.D. Pieper	<i>Jicarilla Apache Agricultural Project Environmental Assessment -</i> Environmental Protection Agency (proposal submitted)	\$27,000 10/93-9/95

Related Team Efforts

R.D. Pieper and John Mexal recently attended a planning meeting involving representatives from Northern Arizona University, Utah State Univ. Univ. of Ariz., Ariz. State Univ., and Western New Mexico Univ. to form a consortium for forestry research funded by the US Forest Service.

Special Facilities and Holdings

Facilities: College Ranch - similar to Jornada Experiment Range; Corona Range Research Station

William Quintana

Chemistry and Biochemistry

Arts and Sciences

Box 30001 Dept. 3C Chemistry 34

Phone 646-2410 FAX 646-2649 E-Mail

Interests boron hydrides chemistry, ceramic materials, transition metal interactions with main group elements

Publications

Workman, D.P., W. Quintana, and S.G. Shore. 1991. Structure of $(\mu\text{-I})_2 \text{Os}_2 (\text{CO})_6 \text{I}_2$. *Acta Cryst.* C47:6.

Research Support

W. Quintana	<i>Interactions of Boron Hydrides with Transition Metal Acetylides -</i> NMSU Minigrant	\$2,000
W. Quintana	<i>Synthesis of Ceramic Precursors Based on Boron Hydride/SURP -</i> Sandia National Laboratory	\$35,000 12/93-9/94
W. Quintana	<i>Reactivity of Transition Metal Acetylides with Boron -</i> American Chemical Society/Petroleum Resources Fund (proposal submitted)	\$18,000
W. Quintana	<i>Synthesis and Characterization of Pre-ceramic Precursors</i> (minority research initiation planning grant) - National Science Foundation	\$12,000 8/92-1/94
W. Quintana	<i>Molecular Precursors to Ceramics—ORAU Junior Faculty Enhancement</i> Award - Oak Ridge Associated Universities (proposal submitted)	\$10,000 7/94-6/95

Special Facilities and Holdings

Bibliographies: ACS CAS on line

Bobby J. Rankin

Animal and Range Sciences

Agriculture and Home Economics

Box 30003 Dept. 3-I Knox Hall 202

Phone 646-2515 FAX 646-5441 E-Mail brankin@nmsu.edu

Interests range management, crossbreeding systems for increasing beef production**Foreign Experience**

Involved in the University Developmental Linkage Project team - Paraguay Linkage. One objective is to initiate a master of science degree program in Environmental Management in the National University of Asuncion, Paraguay.

Experience in course development in Chihuahua and Chiapas, Mexico. Study tour to Senegal, Mali, Nigeria and Kenya to gain knowledge of range and livestock production in Africa. Served on project review team for USAID project in West African country of Gambia. Evaluated beef cattle project in Algeria.

Related Team Efforts

University Developmental Linkage Project team - Paraguay Linkage. One objective is to initiate a master of science degree program in Environmental Management in the National University of Asuncion, Paraguay.

Special Facilities and Holdings

Facilities: NMSU Corona Range and Livestock Research Center - a 28,000 plus acre cattle and sheep ranch located in central New Mexico (abundant mule deer). Open grassland and pinyon-juniper woodland. NMSU College Ranch, a 63,000 acre cattle ranch located in the Chihuahuan desert near Las Cruces. Clayton Livestock Research Center - a 1000 head experimental cattle feedlot located near Clayton, NM (includes 140 acres of irrigated cropland).

Gary D. Rayson

Chemistry and Biochemistry

Arts and Sciences

Box 30001 Dept. 3C Chemistry 141

Phone 646-5839 FAX 646-2649 E-Mail grayson@nmsu.edu

Interests characterization of metal binding to biomass materials for environmental remediation and waste minimization**Publications**

Ke, H.-Y.D., E.R. Birnbaum, D.W. Darnall, P.J. Jackson and G.D. Rayson. 1992. Investigation of Eu(III) binding sites on *Datura innoxia* using Eu(III) luminescence. *Applied Spectrosc.* 46:479-488.

Ke, H.-Y.D., E.R. Birnbaum, D.W. Darnall, G.D. Rayson and P.J. Jackson. 1992. Characterization of the carboxyl groups on *Datura innoxia* using Eu(III) luminescence. *Environ. Sci. and Tech.* 26:782-788.

Rayson, G.D. and D.Y. Shen. 1992. Description and characterization of a linear flow torch for inductively coupled plasma. *Applied Spectrosc.* (In press).

Rayson, G.D. and D.Y. Shen. 1992. Inductively coupled argon plasma axial viewing absorption measurements using a power modulated plasma. *Spectrochim. Acta.* 47B:553.

Rayson, G.D. and H.-Y.D. Ke. 1992. Characterization of Cd²⁺ binding to *Datura innoxia* using ¹¹³Cd NMR. *Environ. Sci. and Tech.* 16:1202-1205.

Rayson, G.D. and H.-Y.D. Ke. 1992. Characterization of UO₂+2 binding to *Datura innoxia* using UO₂+2 luminescence. *Appl. Spectrosc.* 46:1168-1175.

Rayson, G.D. and H.-Y.D. Ke. 1992. Luminescence linewidth broadening and nonradiative energy transfer studies of solid UO₂+2 *Datura*. *Appl. Spectrosc.* 45:1376-1381.

Rayson, G.D. and D.Y. Shen. 1991. Inductively coupled plasma axial viewing absorption technique with laminar-flow coolant gas. *Spectrochim. Acta.* 46B:1237-1242.

Rayson, G.D. and C. Johnson. 1991. A new approach to the investigation of preatomization mechanisms occurring within a graphite furnace atomizer. *Applied Spectrosc.* 45:1305-1309.

- Rayson, G.D. and D.Y. Shen. 1991. Impact of scattering on axial viewing absorption measurements within an inductively coupled plasma. *Applied Spectrosc.* 45:706-708.
- Rayson, G.D. and D.A. Bass. 1991. A simultaneous comparison of four se hollow cathode lamps used in graphite furnace atomic absorption spectrometry. *Applied Spectrosc.* 45:1049-1050.
- Rayson, G.D. and V.M. Chrisman. 1990. Comparison of aerosol sample introduction systems for a DCP. *Applied Spectrosc.* 44:96.
- Rayson, G.D. and D.Y. Shen. 1990. Inductively coupled plasma axial viewing absorption technique. *Analytical Chem.* 62:1239.
- Wang, J., G.D. Rayson and Z. Taha. 1992. Batch injection analysis using fiber-optic fluorometric detection. *Applied Spectrosc.* 46:107-110.
- Wang, J., T. Baomin and G.D. Rayson. 1992. Bioaccumulation and voltammetry of gold at flower-biomass modified electrodes. *Talanta.* (In press).
- Wang, J., G.D. Rayson, Z. Lu and H. Wu. 1990. Coated amperometric electrode arrays for multicomponent analyses. *Analytical Chem.* 62:1924.

Research Support

G.D. Rayson P. Jackson	<i>Recovery of Toxic Heavy Metals from Contaminated Groundwater - WERC</i>	\$177,000 1990-92
G.D. Rayson	<i>Application of Resonance Lines for the Optical Detection of Rare-earth and Actinide Element - Sandia National Laboratories</i>	\$100,000 1988-present
G.D. Rayson	<i>Investigation of the Temporal and Thermal Impact of Matrix Modifiers Used with Electrothermal Atomizers in Atomic Absorption Spectrometry - currently unfunded</i>	
G.D. Rayson	<i>Non-LTE Excitation Temperature Measurements in an Ambient-Pressure Plasma Discharge - currently unfunded</i>	
G.D. Rayson	<i>Recovery Toxic Metals/Groundwater - DOE/WERC</i>	\$72,759 3/90-12/90
G.D. Rayson D. Darnall	<i>Recovery of Toxic Heavy Metals from Contaminated Groundwater - DOE/NMSU WERC</i>	\$177,935 3/90-2/93
G.D. Rayson	<i>Removal of Toxic Heavy Metals Using a Cultural Biomass Material - National Science Foundation</i>	\$116,500 9/93-5/95
G.D. Rayson	<i>Removal of Toxic Heavy Metals from Contaminated Waters Using a Cultured Biomass Material - Environmental Protection Agency (proposal submitted)</i>	\$327,401 1/94-12/97

Related Team Efforts

Funded effort to characterize metal binding to a cultured biomass material from *Daturaimoxia* by the New Mexico Waste-management Education and Research Consortium with the Department of Energy. This is in collaboration with scientists at Los Alamos National Laboratory.

Special Facilities and Holdings

Other: cultured cell material from *Datura innoxia*

R. Craig Runyan

Extension Plant Sciences
Agriculture and Home Economics
Box 30001 Dept. 3AE Gerald Thomas 237
Phone 646-1131 FAX 646-5975 E-Mail

Interests agricultural water use, irrigation efficiency, nutrient management, pesticide management, animal waste management, sustainable agriculture and water use in development technologies

Publications

Runyan, C., K. Downer, and J. Gleason. 1992. Calibration of Spray Equipment. Cooperative Extension Service V956.
Runyan, C., K. Downer, and J. Gleason. 1992. Water Quality. Cooperative Extension Service V955.
Runyan, C., K. Downer, and J. Gleason. 1992. Well Head Safety with Pesticides. Cooperative Extension Service V955.

Research Support

R.C. Runyan M. English M. Duttle P. Peck	<i>Dona Ana/Sierra Hydrologic Unit Project</i> - US Department of Agriculture	\$65,000
R.C. Runyan	<i>New Mexico Improved Water Quality Programs: Curry/Roosevelt Wellhead Professional Program; Hidalgo/Grant/Catron Riparian Project; Socorro-Las Nutrias Project Support; Eddy-Water Quality Improvement</i> - US Department of Agriculture	\$55,000
R.C. Runyan	<i>Dona Ana-Sierra Hydrologic Unit Project</i> - US Department of Agriculture (proposal submitted)	\$145,820 10/92-9/93

Related Team Efforts

Dona Ana/Sierra Hydrologic Unit Project interagency project in sustainable agricultural water use practices. Involves NMSU-CAHE research faculty, Extension faculty, USDA agencies, Elephant Butte Irrigation District, and others.

Special Facilities and Holdings

Equipment: educational display materials for demonstrations available for extension-related programs

Scott Rushforth

Sociology and Anthropology
Arts and Sciences
Box 30001 Dept. 3BV Breland 304
Phone 646-2826 FAX 646-3725 E-Mail

Interests cultural anthropology, anthropological linguistics, Native American ethnology, Mescalero Apache language

Publications

Rushforth, S. and S. Upham. 1992. *A Hopi Social History: Anthropological Perspectives on Sociocultural Persistence and Change*. Univ. of Texas Press: Austin, TX.
Rushforth, S. 1992. The legitimation of beliefs in a hunter-gatherer society: Bearlake Athapaskan knowledge and authority. *Amer. Ethnologist*. 19:3:483-500.
Rushforth, S. and J.S. Chisholm. 1991. Uses of Bearlake and Mescalero (Athapaskan) classificatory verbs. *Intl. J. Amer. Linguistics*. 57:2:251-266.
Rushforth, S. and J.S. Chisholm. 1991. *Cultural Persistence: Aspects of Meaning and Morality among the Bearlake Athapaskans*. University of Arizona Press: Tucson, AZ.

Research Support

S. Rushforth	<i>The Semantics of Bearlake Athapaskan Classificatory Verbs</i> (current research paper for edited book)
S. Rushforth	<i>Contemporary Native Americans</i> (coeditor with Peter M. Whiteley of a book on Native American culture and society)

Zohrab A. Samani
Civil, Agricultural, and Geological Engineering
Engineering
Box 30001 Dept. 3CE
Phone 646-2904 FAX 646-6049 E-Mail

Interests agricultural engineering, water resources

Research Support

Z.A. Samani	<i>Minority Students Research Participation - Arizona State University</i>	\$738 1/92-5/93
D. Heil Z.A. Samani	<i>The Competitive Binding of Lead by EDTA in Soils and Implications for Heap Leaching Remediation - WERC</i>	\$31,451 5/93-5/95
Z. Samani G. Smith R. Jacquez	<i>Denitrification as a Means to Remediate Groundwater Contaminated with Dairy Waste - USDA/Cooperative State Research Service</i>	\$50,000 9/93-9/95
T. Jones Z. Samani	<i>An Expert System to Optimize Irrigation and Reduce Groundwater Contamination - Intelligent Reasoning Systems, Inc. (proposal submitted)</i>	\$10,386 5/94-2/95

Foreign Experience

Samani coordinated two workshops during the summer of 1993: Design and Operation of Small Scale Irrigation Systems for participants from Honduras and Venezuela; and Use of Computers in Irrigation Design and Management for participants from Venezuela and Turkmenistan.

Theodore W. Sammis

Agronomy and Horticulture
Agriculture and Home Economics
Box 30003 Dept. 3Q Knox Hall 305
Phone 646-2104 FAX 646-6041 E-Mail

Interests hydrology, atmospheric research including unsaturated zone contaminant transport models for waste management, climate data base

Publications

Asare, D.K., T.W. Sammis, H. Assadian, and J.L. Fowler. 1992. Selection of the best computer irrigation scheduling model. *Proc. Int'l Conf. on Advances in Planning Design and Management of Irrigation Systems as Related to Sustainable Land Use*. Leuven, Belgium. 2:825-835.

Bucks, D.A., T.W. Sammis and G.L. Dickey. 1991. Irrigation for arid areas in management of farm irrigation systems. *Management of Farm Irrigation Systems*. G.J. Hoffman, T.A. Howell, and K.H. Solomon (eds.). ASAE Monograph. pp. 499-542.

Gallardo, C., Z.A. Samani, and T.W. Sammis. Conjunctive use of surface and ground water. Irrigation and Drainage. *Proc. 1990 Nat'l Conf. Amer. Soc. Civil. Eng.* July 11-13, Durango, CO. pp. 77-84.

Mott, P. and T.W. Sammis. 1990. Automatic weather data collection and processing. *Proc. Amer. Soc. Ag. Engineers*. Columbus, OH.

Sammis, T.W. and J. Jernigan. 1992. Crop water stress index of ornamental plants. *Amer. Soc. Ag. Eng. Applied Engineering*. 8:2:191-198.

Sammis, T.W., P. Mott, and D. Jackson. 1991. Computer controlled irrigation scheduling. *Amer. Soc. Ag. Eng. Symposium. Automated Agriculture for the 21st Century*. Chicago, IL. pp. 284-289.

Sammis, T.W. and Z.A. Samani. 1990. Drainage system designs as affected by deficit irrigation under shallow ground water conditions. *Proc. Symposium on Land Drainage for Salinity Control in Arid and Semi-Arid Regions*. Cairo, Egypt.

Sammis, T.W., S. Williams, and I.P. Wu. 1990. Development of a trickle irrigation scheduling model. *Computers and Electronics in Agriculture*. 5:187-196.

Research Support

T.W. Sammis V. Gutschick W. Whitford	<i>Physiological Control of Evapotranspiration by Vegetation</i> - NOAA	\$300,000 3 yrs
T.W. Sammis M. Campana	<i>Evaluation of Unsaturated Zone Contaminant Transport Models for Waste Management - Phase II</i> - WERC	\$50,575 2/91-2/93
T.W. Sammis D. Smeal	<i>Atrazine Transport in Distribution of Field under Different Irrigation Regimes</i> - state funded	
T.W. Sammis D. Smeal	<i>Atrazine Transport and Distribution in a Field Soil under Different Irrigation Regimes</i> - USDA/Cooperative State Research Service	\$48,860 9/92-9/94
J. Mexal L. Matthews T.W. Sammis	<i>Increasing Scientist Diversity in Agriculture and Natural Resources</i> - US Department of Education (proposal submitted)	\$92,001 1/94-12/96
T.W. Sammis J. Corgan	<i>Computer Controlled Irrigation to Prevent Ground Water Contamination</i> - USDA/Cooperative State Research Service (proposal submitted)	\$125,244 7/93-6/96

Foreign Experience

Sammis is scheduled to attend the International Arid Lands Consortium Workshop in Jerusalem in June. He will be responsible for heading a session and assisting with writing the workshop outcomes. In August he will present at paper at the XII CIGR World Congress and AgEng '94 Conference on Agricultural Engineering in Milano, Italy.

Special Facilities and Holdings

Datasets: climate data base network around the state

Sanford D. Schemnitz

Fishery and Wildlife Sciences
Agriculture and Home Economics
Box 30003 Dept. 4901 Knox Hall 114
Phone 646-1136 FAX 646-5975 E-Mail

Interests wildlife ecology, herbicide treatment of salt cedar with arsenal, organochlorine levels in aplomado falcon habitat

Publications

- Coates, K.P., and S.D. Schemnitz. 1990. Use of rodent middens as mineral licks by bighorn sheep. *Proc. Northern Wild Sheep and Goat Council Symp.* 7:206-209.
- Coates, K.P., J.C. Udem, B.C. Weitz, S.D. Schemnitz and J.T. Peters. 1990. Adaptation of a technique for implanting heart rate transmitters in bighorn sheep. *Proc. Northern Wild Sheep and Goat Council Symp.* 7:143-148.
- Liedlich, D.L., D.R. Lockwood, S.D. Schemnitz, D. H. Sutcliffe. 1991. Ecology of Merriam's wild turkey in the Sacramento Mountains, south-central New Mexico. *Ag. Exp. Stat. Bull.* 757.
- Moreno, D.G., G. Notah, and S.D. Schemnitz. 1991. Chile crops and blackbirds: Are they related? Abstract. *NM Ornithol. Soc. Bull.* 19:2:35.
- Schemnitz, S.D. 1992. Weights, measurements and foods of free-ranging turkeys in New Zealand. *J. Ornithol. Soc. New Zealand.* 39:2:126-129.
- Schemnitz, S.D. and W. Zeedyk. 1992. The wild turkey biology and management. Stackpole Books Co. J.G. Dickson (ed.). pp. 350-360.
- Wolters, G.L., T.T. Ireland, and S.D. Schemnitz. 1991. Reclamation, biotic diversity and management of disturbed southwestern United States rangeland. *Proc. Int'l Rangeland Congress.* 4:179-185.

York, D.L. and S.D. Schemnitz. 1991. Habitat use, diet, movements, and home range of Gould's turkey in the Peloncillo Mountains, NM. Abstract. *NM Ornithol. Soc. Bull.* 19:2:32.

Research Support

S.D. Schemnitz R. Pieper D. Clason	<i>Ecology and Status of Gould's Turkey in New Mexico</i> - US Forest Service, NM Game and Fish, and NM Wild Turkey Federation	\$23,500
S.D. Schemnitz K. Duncan K. McDaniel	<i>Impacts of a Herbicide Treatment of Salt Cedar with Arsenal on Wildlife Communities</i> - Pecos River Riparian Restoration	\$20,000/yr 3 yrs
S.D. Schemnitz W. Mueller	<i>Organochlorine Levels in Aplomado Falcon Habitat</i> - US Fish and Wildlife Service	\$8,000
S.D. Schemnitz M. Cardenas	<i>Demographic and Attitudinal Survey of El Paso Zoo Multicultural Visitors</i> - Environmental Protection Agency	\$5,000
S.D. Schemnitz	<i>Determination of the Population Status of Gould's Turkey in Coronado National Forest</i> - National Wild Turkey Federation	\$1,350 6/91-5/92
S.D. Schemnitz	<i>Food Habits of the Desert Quail in Southwestern New Mexico</i> - NM Game and Fish Department	\$3,500 10/92-6/94
S.D. Schemnitz J. Kiseda	<i>Demographic and Attitudinal Survey of El Paso Zoo Multicultural Visitors</i> - Environmental Protection Agency (proposal submitted)	\$4,994 6/93-12/93

Foreign Experience

Schemnitz spent October 1992 in Washington DC reviewing 32 Fulbright Scholar applications in the areas of life science. Schemnitz received two Fulbright 7-month sabbaticals in Nepal (1984) and Kenya (1990).

Related Team Efforts

Schemnitz is the contact person for the El Paso Zoo Visitor Survey.

Jerry G. Schickedanz

Cooperative Extension

Agriculture and Home Economics

Box 30003 Dept. 3AE Gerald Thomas 220

Phone 646-3016 FAX 646-5975 E-Mail jschicke@nmsu.edu

Interests broom snakeweed research, range management, locoweed

Research Support

J.G. Schickedanz G. Kinzer B. Rankin	<i>Locoweed Research</i> - Agricultural Research Service	\$200,000
J.G. Schickedanz	<i>Ecology, Control and Detoxification of Locoweed</i> - USDA/Agricultural Research Service	\$342,000 3/91-3/96
J.G. Schickedanz G. Kinzer B. Rankin	<i>Broom Snakeweed Research</i> - USDA/Cooperative State Research Service	\$188,833 9/93-8/94

Rudi Schoenmackers

Southwest Technology Development Institute
Engineering
Box 3001 Dept. 3SOL Engineering Complex I 103
Phone 646-2639 FAX 646-2960 E-Mail

Interests solar and geothermal energy resources

Research Support

R. Schoenmackers	<i>Assistance with Photovoltaic System Training for the Gansu Natural Energy Research Institute - Daystar, Inc.</i>	\$31,000 6/91-2/92
R. Schoenmackers	<i>Development of a National Traffic Monitoring Device Testing Plan - NM Highway Department</i>	\$250,000 8/93-1/95

Foreign Experience

Schoenmackers and R. Foster hosted government officials and engineers from China during March 1993. The Chinese were interested in collaborating on renewable energy development projects and were visiting various solar and wind energy installations in the US. Schoenmackers, along with R. Jacquez, H. Matteson, and J. Burn, in February 1993, visited Univ. Nac. Autonoma de Mexico to discuss mutual interest in space, astronomy, energy and the environment.

Special Facilities and Holdings

Facilities: Geothermal Greenhouse Research Facility; Southwest Regional Experiment Station for Photovoltaic Power Systems; Wetlands Research Facility
Equipment: respirometer
Datasets: database of geothermal resources in NM; long-term performance data of solar cells

Jill Schroeder

Entomology, Plant Pathology and Weed Science
Agriculture and Home Economics
Box 30003 Dept. 3BE Gerald Thomas 294
Phone 646-3225 FAX 646-5975 E-Mail

Interests soil/herbicide interactions, herbicide persistence in soil, herbicide movement in soil, herbicide degradation, water quality, weed management, weed/pest interactions

Publications

Kenney, M.J., J. Schroeder, S.H. Thomas, and L.W. Murray. 1992. Influence of metolachlor on root-knot nematode (*Meloidogyne incognita*) interaction with *Cyperus esculentus* and *Capsicum annum*. *Proc. West. Soc. Weed Sci.* Salt Lake City, UT. 45:80.
Kenney, M.J., J. Schroeder, L.W. Murray, and S.H. Thomas. 1992. Effects of a herbicide on yellow nutsedge and chile pepper suitability as hosts of *Meloidogyne incognita*. Abstract. *J. Nematol.* 24.
Schroeder, J., M.J. Kenney, S.H. Thomas, and L. Murray. 1993. Yellow nutsedge response to southern root-knot nematode, chile pepper, and metolachlor. *Weed Science*. (Accepted).
Schroeder, J. 1993. Chlorimuron and imazaquin persistence in selected southern soils under controlled conditions. *Weed Science*. (In review).
Schroeder, J. 1993. Late-season interference of spurred anoda in chile peppers. *Weed Science*. 41:172-179.
Schroeder, J., S.H. Thomas, and L. Murray. 1993. Yellow and purple nutsedge and chile peppers host southern root-knot nematode. *Weed Sci.* 41:150-156.

Schroeder, J. 1992. Pepper cultivar (*Capsicum annuum*) response to metolachlor in three New Mexico soils. *Weed Technology*. 6:366-373.

Schroeder, J. and D.C. Elmore. 1992. Woolly morning glory as a weed-taxonomic clarification. *Weed Technology*. 6:1027-1030.

Schroeder, J. 1992. Oxyfluorfen for postemergence weed control in hot peppers. *Weed Technology*. 6:1010-1014.

Schroeder, J., D.E. Kiehl, N.B. Christensen, and T.L. Jones. 1992. Metolachlor dissipation in furrow-irrigated conventional till and minimum till grain sorghum. Abstract. *Weed Sci. Soc. Amer. Abstracts*. 32:210.

Schroeder, J. 1992. Chlorimuron persistence in southern soils under controlled conditions. Abstract. *Proc. Southern Weed Sci. Soc.* 45:370.

Schroeder, J., N. Christensen, and J. Libbin. 1992. Weed management in a wheat, grain sorghum, fallow system. *Proc. West. Soc. Weed Sci.* Salt Lake City, UT. 45:39.

Schroeder, J. and C. Barnes. 1992. Weed control in cotton with postemergence directed herbicide applications. Ag. Exp. Sta. Tech. Rep. 8.

Schroeder, J. 1992. Weed Science Research Report. Dept. Entomol., Plant Pathol., and Weed Sci. Las Cruces, NM.

Schroeder, J. 1992. Weed Science Research. Field Day. C.E. Barnes (ed.). Ag. Sci. Center, Artesia.

Schroeder, J., C.E. Barnes, and G. Hoxworth. 1992. Herbicides for use in cotton. Ag. Sci. Center, Artesia, Ann. Rep.

Thomas, S.H., J.J. Kenney, J. Schroeder and L. Murray. 1994. *Meloidogyne incognita* inoculum source influences yellow nutsedge and chile pepper. *J. Nematol.* (In review).

Research Support

J. Schroeder N. Christensen T. Jones J. Hendrickx (NMTECH)	<i>Metolachlor and Atrazine Movement and Persistence in Furrow-irrigated Conventional and No-till Systems - Cooperative State Research Service</i>	\$178,000 1991-93
J. Schroeder R. Bowman (NMTECH)	<i>Plant Uptake and Plant Toxicity of Fluorobenzoates used as Soil and Groundwater Tracers - Cooperative State Research Service</i>	\$110,000 1992-94
J. Schroeder several collaborators	<i>Weed Management Projects in New Mexico Cropping Systems</i>	\$92,600 1988-93
J. Schroeder N. Christensen J. Libbin	<i>Economic Comparison between Chemical Fallow No-till Farming Systems and Conventional Clean-till Farming Systems - WRPLAP</i>	\$38,837 1991-93

William R. Seager

Geological Sciences
Arts and Sciences
Box 30001 Dept. 3AB Breland 129
Phone 646-3017 FAX 646-6096 E-Mail

Interests structural geology, tectonics, field geology

Research Support

W.R. Seager	<i>Geology of Caballo Mountains - NM Bureau of Mines and Mineral Resources</i>	\$2,000/yr
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Rhonda Skaggs

Agricultural Economics and Agricultural Business
Agriculture and Home Economics
Box 30001 Dept. 3169
Phone 646-3215 FAX 646-3522 E-Mail

Interests agriculture and natural resource policy

Publications

- Skaggs, R. 1992. Agrarian beliefs: Implications for teaching, student recruitment and retention. *Nacta J.* 36:2:15-18.
- Skaggs, R. and D.L. Snyder. 1992. A comparison of selected methods for forecasting monthly alfalfa hay prices. *Agribusiness: An Int'l J.* 8:309-321.
- Skaggs, R. 1992. What do alfalfa hay buyers want? *Alfalfa Market News*. Cooperative Extension Service.
- Skaggs, R. and D.L. Snyder. 1991. A note on the evaluation of turning point accuracy. Economic Research Institute Paper ERI 91-01. Utah State Univ. Dept. of Economics.
- Skaggs, R. and D.L. Snyder. 1991. Accuracy in forecasting: The results of a competition. Economic Research Institute Paper ERI 91-02. Utah State Univ. Dept. of Economics.

Research Support

Gonzalez, I.	<i>International Student Agribusiness Resources</i> - USDA Challenge Grant	\$66,233
Skaggs, R.	Service Program	9/93-8/95

Foreign Experience

In July Skaggs did on-site evaluations of student interns working through the STARS program in Mexico City, Hermosillo, and Zacatecas.

Daniel Smeal

Agricultural Science Center/Farmington
Agriculture and Home Economics
Box 30003 Dept. 3BF
Phone 327-7757 FAX 325-5246 E-Mail

Interests pesticides and groundwater, tillage, irrigation and fertilizer effects on growth, yield and evapotranspiration of agricultural crops, crop consumptive use curves, nitrate-atrazine leaching, nitrate transport, sewage sludge, manure, corn, alfalfa, wheat

Publications

- Arnold, R.N., M.W. Murray, E.J. Gregory and D. Smeal. 1993. Weed control in pinto beans (*Phaseolus vulgaris*) with imazethapyr combinations. *Weed Tech.* 7:361-364.
- Arnold, R.N., M.W. Murray, E.J. Gregory and D. Smeal. 1991. Weed control in established alfalfa (*Medicago sativa*). NMSU Ag. Exp. Sta. Res. Rpt. 663.
- Arnold, R.N., M.W. Murray, E.J. Gregory and D. Smeal. 1990. Weed control in established alfalfa (*Medicago sativa* L.) *Appl. Agric. Res.* 5:3:195-197.
- Arnold, R.N., E.J. Gregory, D. Smeal and M.W. Murray. 1990. Annual weed control with selected herbicides in field corn grown in coarse-textured soil. NMSU Ag. Exp. Stat. Res. Rpt. No. 643.
- Arnold, R.N., E.J. Gregory, D. Smeal and M.W. Murray. 1990. Residual effects of DPX-R9674 in field corn, pinto beans and potatoes. *Proc. West. Soc. Weed Sci.* 43:77.
- Gregory, E.J., C. Owen, R.N. Arnold and D. Smeal. 1993. Performance of spring oat varieties in northwestern New Mexico. NMSU Ag. Exp. Stat. Tech. Rpt.
- Gregory, E.J., R.N. Arnold and D. Smeal. 1991. Pesticide management at the Agricultural Science Center, Farmington, NM. *Agron. Abst.* p. 70.
- Smeal, D. and H. Zhang. 1994. Chlorophyll meter evaluation for nitrogen management in corn. *Commun. Soil Sci. Plant Anal. Proc.* (Accepted).
- Smeal, D., J. Tomko, E.J. Gregory and R.N. Arnold. 1993. Water Use and Yield of Alfalfa in Northwestern New Mexico. NMSU Bulletin. (In review).
- Smeal, D., R.N. Arnold, and E.J. Gregory. 1992. Interseasonal variability in the water use-production function of alfalfa. *J. Prod. Ag.* 5:576-580.
- Smeal, D., E.J. Gregory, and R.N. Arnold. 1992. Yield and seed quality of winter canola as related to irrigation. *Agron. Abstracts. Amer Soc. Agron.*
- Smeal, D., C.E. Kallsen and T.W. Sammis. 1991. Alfalfa yield as related to transpiration, growth stage, and environment. *Irrig. Sci.* 12:79-86.

Research Support

D. Smeal	<i>Tillage and Nitrogen Effects on Crop Growth, Water-use, and Soil Characteristics in Northwestern New Mexico</i> (this project began in 1983 although the focus as evolved through the years) - Agricultural Experiment Station	\$7,000/yr 1983-current
D. Smeal	Navajo Agricultural Products Inc. (supplemental)	\$75,000 1988-current
D. Smeal	<i>Effects of Sulphur Fertilizers on Soil Ph and the Growth, Yield, and Quality of Agronomic Crops</i> - Giant Industries, Inc. and Gary-Williams Energy Corp.	\$6,000 1/94-1/95
D. Smeal	<i>1994 USDA Research Apprenticeship Program</i> - USDA/Cooperative State Research Service (proposal submitted)	\$2,492 6/94-8/94
T.W. Sammis D. Smeal	<i>Transport and Distribution in a Field Soil Under Different Irrigation Regimes</i> - USDA/Cooperative State Research Service	\$48,860 9/92-9/94

Related Team Efforts

Consulting activities: NAPI and other local growers on consumptive-use, irrigation scheduling. Texas A&M University on experimental design. San Juan Mining Co. on irrigation of strip-mined sites. City of Farmington, Parks Division on water quality and irrigation of newly established turf. NAPI on calibration of neutron probes and set-up of automated weather data collection system.

Geoffrey B. Smith

Biology

Arts and Sciences

Box 30001 Dept. 3AF Foster Hall 232

Phone 646-6080 FAX 646-5665 E-Mail gsmith@nmsu.edu

Interests groundwater microbiology, groundwater contamination, monitoring and tracking microorganisms in the environment through molecular techniques

Publications

Smith, G.B. and J.M. Tiedje. 1992. Isolation and characterization of a nitrite reductase gene and its use as a probe for denitrifying bacteria. *Appl. Environ. Microbiol.* 58:376-384.

Research Support

G.B. Smith	<i>Benzene and TCE Biodegradation in Aquifer Microcosms</i> - WERC	\$99,500 2/92-2/95
G.B. Smith F. Cadena G. Eiceman	<i>On-Line Monitoring of Bacteria in Water Treatment Plants</i> - National Science Foundation Improvement in Minority Institutions Program (proposal submitted)	\$300,000 3 yrs
G.B. Smith C.M. McCarthy	<i>Determining the Potential for Biodegradation in a Contaminated Aquifer</i> - H+GCL, Geoscience Consultants NASA contract	\$29,000 summer 92
G.B. Smith	<i>Biodegradation of Benzene, PCE and TCE in Sand Aquifer Microcosms under Denitrifying, Low-carbon Conditions</i> - DOE/WERC	\$30,958 2/92-2/93

Z. Samani G. Smith R. Jacquez	<i>Denitrification as a Means to Remediate Groundwater Contaminated with Dairy Waste</i> - USDA/Cooperative State Research Service	\$50,000 9/93-9/95
M. Wall G.B. Smith	<i>Attachment Mechanisms of Biocontrol Yeasts to Postharvest Fungal Pathogens</i> - USDA/Cooperative State Research Service (proposal submitted)	\$81,015 7/93-6/95

Special Facilities and Holdings

Other: have developed a DNA probe for denitrifying bacteria

Phillip R. Smith

Mechanical Engineering
Engineering
Box 30001 Dept. 3450
Phone 646-3501 FAX 646-6111 E-Mail

Interests air quality studies

Publications

Smith, P.R., E. Hensel, and I. Leslie. 1992. Nuclear waste repository ventilation system studies. Tech. Completion Rpt. DOE-WERC Proj. Ann. Rpt.

Research Support

P.R. Smith I. Leslie C. Skowlund	<i>Charged Aerosol Scrubber for Air Purification</i> - DOE/WERC	\$80,934 2/91-2/93
E. Hensel P.R. Smith R. Pederson	<i>Center for Software Technology Reinvestment</i> - National Science Foundation (proposal submitted)	\$9,379,075 7/94-6/99
P.R. Smith G. Reynolds H. Julien	<i>Research Instrumentation in Support of Experimental Fluid Mechanics at New Mexico State University</i> - US Department of Defense (proposal submitted)	\$403,359 10/93-9/95

Richard W. Spellenberg

Biology
Arts and Sciences
Box 30001 Dept. 3AF
Phone 646-3732 FAX 646-5665 E-Mail

Interests plant taxonomy

Publications

- Spellenberg, R.W. and S. Rodriguez. 1992. Chromosome numbers for five Chihuahuan species of *Quercus* (Fagaceae). *Phytologia*. 72:40-41.
- Spellenberg, R.W. 1992. A new species of black oak (*Quercus*, subg. *Erythrobalanus*, Fagaceae) from the Sierra Madre occidental, Mexico. *Amer. J. Botany*. 79:1200-1206.
- Spellenberg, R.W. 1992. Numeros cromisomicos en *Astragalus* (Fabaceae) y una enmienda a la descripcion de *A. zacatecanus* (Rydb.) Barneby. *Acta Botanica Mexicana*. 18:17-20.
- Spellenberg, R.W., M. Mahrt, and R. Brozka. 1991. Noteworthy collections—New Mexico. *Madrono*. 38:298-301.

Research Support

R.W. Spellenberg	<i>Flora of North America of Mexico - Phase 2</i> - Missouri Botanical Garden	\$26,548 9/90-2/94
R.W. Spellenberg	<i>Improvement of the NMSU Herbarium as a Research and Teaching Facility for Plant Ecology, Systematics, and Evolution</i> - National Science Foundation	\$33,147 7/93-12/94

Foreign Experience

Mexico, Paraguay, Yemen, Europe

Roger D. Steeb

Library

Arts and Sciences

Box 30006 Dept. 3475 Library
Phone 646-6171 FAX 646-4335 E-Mail

Interests biology, natural history, natural resources of the southwest

Publications

- Steeb, R.D. 1992. How to Do Library Research in Anthropology. NMSU Library Pamphlet. No. 14.
Steeb, R. 1991. Animals of Southern New Mexico: Mammals, Birds, Reptiles and Amphibians, and Fish. NMSU Bibliography.
Steeb, R. 1991. Vegetation Studies of Southern New Mexico. NMSU Bibliography.
Steeb, R. 1990. How to Do Research in Biology. NMSU Library pamphlet.
Steeb, R. 1990. How to Do Research in Engineering. NMSU Library pamphlet.

Special Facilities and Holdings

Bibliographies: Wildlife of Southern New Mexico; Vegetation of Southern New Mexico; NMSU Library Research Series

William A. Taggart

Government

Arts and Sciences

Box 30001 Dept. 3BN Breland 349
Phone 646-4935 FAX 646-3725 E-Mail

Interests public administration, public policy, American government, environmental policy

Publications

- Holmes, M.D. and W.A. Taggart. 1990. A comparative analysis of research methods in criminology and criminal justice journals. *Justice Q.* 7:421-437.
Mays, G.L. and W.A. Taggart. 1990. Court clerks, court administrators, and judges: Conflict in managing the courts. *The Administration and Management of Criminal Justice Organizations: A Book of Readings*. S. Stojkovic, J. Klofas, and D. Kalinich (eds.). Waveland Press: Prospect Heights, IL. pp. 240-248.
Taggart, W.A., N.M. Rubaii-Barrett, and C. Good. 1992. Funding and operation of an intermodal transportation facility at the Santa Teresa border crossing. NMSU. Final Rpt. Contract 93351.
Taggart, W.A., M. Holmes, and H. Daudistel. 1992. Plea bargaining policy and state district courts: An interrupted time series analysis. *Law and Society Rev.* 26:1:139-159.
Taggart, W.A. and M.D. Holmes. 1991. Home style of a US senator: A longitudinal analysis. *The Modern American Congress, 1963-1989*. J. Silbey (ed.). Carlson Publishing Inc.: New York, NY. 3:775-790.
Taggart, W.A. and M.D. Holmes. 1991. Institutional productivity in criminal justice and criminology. *J. Criminal Justice.* 19:549-561.
Taggart, W. 1989. A note on testing models of spending in the American states: The case of public expenditures for corrections. *Western Politica Q.* 42:679-690.

Research Support

W.A. Taggart	<i>Funding and Operation of an Intermodal Facility at the Santa Teresa Border Crossing - Sandia National Laboratories</i>	\$11,856 11/92-12/92
W.A. Taggart	<i>Background Work for Creation of a Port Authority and Federal Zone - Sandia National Laboratories</i>	\$20,000 11/93-5/94

Special Facilities and Holdings

Datasets: environmental policy data, American states - 1970-79 (available on request)

Stephen Thomas

Entomology, Plant Pathology and Weed Science
Agriculture and Home Economics
Box 30003 Dept. 3BE Gerald Thomas 225
Phone 646-2321 FAX 646-5975 E-Mail

Interests nematology, decomposition and nutrient cycling in desert ecosystems, genetic engineering of nematode resistance

Publications

- Aguilar, E.L., S. Thomas and P.W. Bosland. A technique for screening *Capsicum* seedlings for resistance to the southern root-knot nematode (*Meloidogyne incognita*) and evaluation of genetic resistance of nematode resistant *Capsicum* accessions. *Plant Breeding*. (Submitted).
- Schroeder, J., S.H. Thomas and L. Murray. 1993. Yellow and purple nutsedge and chile peppers host southern root-knot nematode. *Weed Science*. 41:150-156.
- Thomas, S.H., M. Cardenas and L. Murray. Relationship of preplant population densities to root-knot nematode damage thresholds for three chile pepper cultivars. *Plant Disease*. (Accepted).
- Thomas, S.H., J.L. Saunders, C. Burgos, G.M. Southward and N.S. Urquhart. Effects of sequential cropping and tillage practices on nematode population densities in Costa Rica. *J. of Nematology*. (Accepted).
- Thomas, S.H. 1992. New Mexico report to the Nematode Management Committee of the Cotton Disease Council. *Proc. Beltwide Cotton Conf.* San Antonio, TX. pp. 162-164.
- Thomas, S.H. and T.J. Roberts. 1992. *Efficacy of Foliar VYDATE Application for Root-Knot Nematode Control and Yield Enhancement in Cotton*. Tech. Completion Rep. to DuPont Ag. Products.
- Thomas, S.H. and T.J. Roberts. 1992. *Nematode Control and Yield Response Associated with TEMIK Applications in Cotton*. Tech. Completion Rep. to Rhone-Poulenc Ag. Company.
- Thomas, S.H., C.L. Potenza, and C. Sengupta-Gopalan. 1992. Controlling *Meloidogyne incognita* induced feeding site development in alfalfa. *Seventh Annual Symposium, Southwest Consortium on Plant Genetics and Water Resources*. November 7-8, Lubbock, TX.
- Thomas, S.H., D.W. Smith and T.J. Roberts. 1991. Effects of *Meloidogyne incognita* race 3 on fiber quality and yield of selected cotton cultivars under furrow irrigation. *J. of Nematology*. 23:552-553.

Research Support

S.H. Thomas C. Gopalan	<i>Nematode-induced Feeding Sites in Alfalfa - Southwest Consortium on Plant Genetics and Water Resources</i>	\$30,000 FY94
S.H. Thomas J. Schroeder	<i>Ecological Relationships between Weed Species and Root-knot Nematodes - NM Agricultural Experiment Station</i>	\$25,000 FY93
S.H. Thomas	<i>Nematode Pests of Cotton - National Cotton Council</i>	\$4,000 1994
S.H. Thomas P. Bosland	<i>Evaluation of Root-knot Nematode Resistance in Chile Peppers - currently unfunded</i>	

Related Team Efforts

Thomas is currently a funded participant in the Southwest Consortium on Plant Genetics and Water Resources. This regionally organized group consists of members from Los Alamos National Lab, Texas Tech Univ., Univ. of Ariz, UC/Riverside and NMSU.

Special Facilities and Holdings

Other: transformed tobacco plants containing genes for different strains of collagenase

Bruce C. Thompson

Fishery and Wildlife Sciences

Agriculture and Home Economics

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Interests wildlife conservation, sustainable use, avian ecology, landscape ecology

Publications

- Burkett, D.W. and B.C. Thompson. 1994. Wildlife association with human altered water sources in semi-arid vegetation communities. *Conservation Biology*. 8:(In press).
- Campo, J.J., B.C. Thompson, J.C. Barron, R.C. Telfair II, P. Durocher, and S.A. Gutreuter. 1993. Diet of double-crested cormorants wintering in Texas. *J. Field Ornithol.* 64:135-144.
- Divine, D.D., B.C. Thompson, D.W. Burkett, and R. Valdez. 1991. Hydrologic considerations related to inventory and evaluation of wildlife water units at White Sands Missile Range. *Proc. 35th Ann. NM Water Conf.: Toward a Common Goal: Forging Water Quality Partnerships*. C. Ortega Klett (ed.). NM Water Resources Research Institute Rpt. No. 257.
- Knadle, G. and B. Thompson. 1993. Movements and mortality assessment of desert bighorn sheep translocated to Ladron Mountains, NM. Professional Services Contract 93516 Comp. Rpt. to NM Dept. of Game and Fish. 29 pp. plus 3 app.
- Thompson, B.C., J.J. Campo and R.C. Telfair II. 1994. Origin, population attributes, and management conflict resolution for double-crested cormorants in Texas. *Colonial Waterbirds*. 17:(In press).
- Thompson, B.C. 1993. A successful elevated suburban Gambel's quail nest. *Southwest Nat.* 38:174-175.
- Thompson, B.C., D.F. Miller, T.A. Doumitt, and T.R. Jacobson. 1992. Ecologically-based management evaluation for sustainable harvest and use of New Mexico furbearer resources. Final report to NM Dept. of Game and Fish, Fed. Aid Proj. W-129-R, Job 1. 130 pp. plus 21 app.
- Thompson, B.C., R. Valdez, D.D. Divine, and D.W. Burkett. 1992. Inventory and evaluation of wildlife water units at White Sands Missile Range. Research Work Order No. 8, Project Completion Report to US Army, White Sands Missile Range. 71 pp. plus 25 app.
- Thompson, B.C., M.E. Schmidt, S.W. Calhoun, D.C. Morizot, and R.D. Slack. 1992. Subspecific status of least tern populations in Texas: North American implications. *Wilson Bull.* 104:244-262.
- Thompson, B.C., J.C. Barron, G.A. Boydston, W.C. Brownlee, and C.A. Martin. 1992. Methodological geographic, and socioeconomic attributes of licensed furtakers in TX, 1982-92. *Texas J. Sci.* 44:175-185.

Research Support

B.C. Thompson	<i>Analysis of Biological Diversity Conservation in New Mexico Using GIS (GAP Analysis) - INT/Fish and Wildlife Service</i>	\$250,000 6/92-12/94
B.C. Thompson	<i>Relative Importance of Rio Grande Corridor Vegetation Types to Avian Communities - INT/Fish and Wildlife Service</i>	\$69,000 7/92-5/94
B.C. Thompson	<i>Biotic Characteristics and Conservation Opportunities for Springs and Associated Riparian Areas on White Sands Missile Range - US Army</i>	\$215,000 9/92-10/95

Foreign Experience

Some travel in Australia and Papua, New Guinea related to crocodilian management programs. Some travel in Switzerland and Mexico observing agricultural systems and associated wildlife.

Special Facilities and Holdings

Facilities: New Mexico Cooperative Fish and Wildlife Research Unit (assistant leader)

Datasets: Gap Analysis (statewide mapping of vegetation communities and vertebrate animal distribution)

L. A. Torell

Agricultural Economics and Agricultural Business

Agriculture and Home Economics

Box 30001 Dept. 3169 Gerald Thomas 379

Phone 646-4732 FAX 646-3522 E-Mail atorell@nmsu.edu

Interests range, ranch economics, production economics, public land policy, ranch computer models, sheep, grazing, rangelands, sagebrush, pest, grasshoppers, broom snakeweed

Publications

- Riggs, W.W. and L.A. Torell. 1991. FEEDLOT: Computer software. Oregon State Univ. Ext. Serv. Special Report 873.
- Torell, L.A., J.W. Bain, and K.C. McDaniel. 1992. Forage production under different canopies of broom snakeweed (*Gutierrezia sarothrae*). Abstracts of Papers, Rangelands: A Public Benefit. *Soc. Range Mgmt.* Spokane, WA. 45:19.
- Torell, L.A., K.C. McDaniel, and J.W. Bain. 1992. Forage production under different canopies of broom snakeweed. *Ag. Exp. Stat.* 1992 Annual Update on the NMSU Broom Snakeweed and Locoweed Projects. pp. 24-25.
- Torell, L.A. 1992. Grazing fees and the value of public land ranches. Abstracts of Papers, Rangelands: A Public Benefit. *Soc. Range Mgmt.* Spokane, WA. 45:19.
- Torell, L.A. and J.M. Fowler. 1992. Grazing Fees: How Much Is Fair? *Ag. Exp. Sta. Res. Rep.* 666.
- Torell, L.A., J.M. Fowler, M. Kincaid, and G. Hawkes. 1992. The Importance of Public Lands to Livestock Production in the U.S. Range Improvement Task Force. Publ. 32.
- Torell, L.A., K.C. McDaniel and K. Williams. 1992. Estimating the life of short-lived, cyclic weeds with Markov processes. *Weed Technology.* 6:62-67.
- Torell, L.A., K.C. McDaniel and K. Williams. 1992. Estimating the life of broom snakeweed using Markov processes. *Ag. Exp. Sta. 1992 Annual Update on the NMSU Broom Snakeweed and Locoweed Projects.* p. 23.
- Torell, L.A., E.T. Bartlett, and F.W. Obermiller. 1992. The Value of Public Land Grazing Permits and the Grazing Fee Dilemma. Range Improvement Task Force. Publ. 31.
- Torell, L.A., K.T. Graham, and C.D. Allison. 1992. Costs and benefits of implementing holistic resources management on New Mexico ranches. *Ag. Exp. Sta. Bull.* 76.
- Torell, L.A., F. Xu, and R.C. Mittelhammer. 1992. Modelling truncation via the logistic and normal distributions: An application to ranch land price analysis. *Proc. 1992 West. Ag. Econ. Assoc.* pp. 374-380.
- Torell, L.A. and W. Word. 1991. Range livestock cost and return estimates for New Mexico, 1989. *Ag. Exp. Sta. Res. Rep.* 656.
- Torell, L.A. and W.W. Riggs. 1991. A less-sophisticated model for ranch planning. *Proc. of Int'l Conf. on Decision Support Systems for Resource Management.* Texas A&M Univ. pp. 71-74.
- Torell, L.A. and J.P. Doll. 1991. Public land policy and the value of grazing permits. *West. J. Ag. Econ.* 16:1:174-184.
- Torell, L.A., K.S. Lyon, and E.B. Godfrey. 1991. Long-run versus short-run planning horizons and the rangeland stocking rate decision. *Amer. J. Ag. Econ.* 73:3:795-807.
- Torell, L.A., W.B. Word, and D.A. Baird. 1991. 1991 costs and returns for an extra-large cow/calf ranch grazing on the Gila National Forest. Cost and Return Estimates. *Coop. Ext. Serv. CRE91-LA-CA3.*
- Torell, L.A., W.B. Word, and D.A. Baird. 1991. 1991 costs and returns for a medium cow/calf ranch grazing on the Gila National Forest. Cost and Return Estimates. *Coop. Ext. Serv. CRE91-LA-CA2.*
- Torell, L.A., W.B. Word, and D.A. Baird. 1991. 1991 costs and returns for a small cow/calf ranch grazing on the Gila National Forest. Cost and Return Estimates. *Coop. Ext. Serv. CRE91-LA-CA1.*
- Torell, L.A. and W. Word. 1991. Range livestock cost and return estimates for New Mexico, 1990. *Ag. Exp. Sta. Res. Rep.* 659.
- Torell, L.A. and F.N. Bledsoe. 1990. 1989 New Mexico private grazing lease arrangements and costs. *Ag. Exp. Sta. Res. Rep.* 651.
- Torell, L.A. and W.W. Riggs. 1990. *RANVAL: A Computer Program for Estimating the Value of New Mexico Ranches, 1980-1989.* *Coop. Ext. Serv. DS-11.*

- Torell, L.A. and J. Libbin, 1990. Allocation of farmland values between surface and water rights. *J. Amer. Soc. Farm Mgrs. and Rural App.* 54:2: 6-15.
- Torell, L.A., K. Williams, and K.C. McDaniel. 1990. Probability of snakeweed die-off and invasion on rangeland. *Snakeweed: Problems and Perspectives*. E.W. Huddleston and R.D. Pieper (eds.). Ag. Exp. Sta. Bull. 751. pp. 71-83.
- Torell, L.A., K. Williams, and K.C. McDaniel. 1990. Economics of broom snakeweed control. *Snakeweed: Problems and Perspectives*. E.W. Huddleston and R.D. Pieper (eds.). Ag. Exp. Sta. Bull. 751. pp. 113-139.
- Torell, L.A. and John A. Tanaka. 1990. Opportunities for traditional methodology in range and ranch economics. 1990. *Current Issues in Rangeland Resource Economics*. OSU Ext. Service Special Report 852. pp. 35-42.
- Torell, L.A. J.D. Libbin, and R.R. Lansford. 1990. The market value of water in the Ogallala aquifer as implied by recent farm sales. *Optimizing the Resources for Water Mgmt.* Reg. Div./ASCE 1990 Ann. Mtg. Fort Worth, TX. pp. 402-406.
- Torell, L.A. J.D. Libbin, and M. Miller. 1990. The market value of water in the Ogallala aquifer. *Land Econ.* 66:2:163-175.
- Word, W.B., L.A. Torell, R.E. Kirksey, and J.D. Libbin. 1990. Profitability of grazing irrigated cropland in the Arch-Hurley Conservancy District. Ag. Exp. Sta. Res. Rep. 645.

Research Support

L.A. Torell K. McDaniel E. Huddleston	<i>Integrated Pest and Agrosystem Management for Sagebrush Rangelands in the Colorado Plateau. 1986-1989 - USDA/Cooperative State Research Service</i>	
L.A. Torell E. Huddleston D. Thompson	<i>Grasshopper Feeding Rates on Southwestern Rangeland - 1987-1989 - USDA-APHIS</i>	
L.A. Torell K. McDaniel	<i>Integrated Pest Management for Economical Control of Broom Snakeweed - 1988-1989 - USDA Western Region IPM Project</i>	
L.A. Torell K. McDaniel	<i>Treatment and Economic Control of Broom Snakeweed - 1989 - Range Improvement Task Force</i>	
L.A. Torell J. Doll	<i>Ranch Technologies Updated - 1989-1994 - NMSU Agricultural Experiment Station</i>	
L.A. Torell	<i>Public Land Policy and the Value of New Mexico Ranches - 1989 - Range Improvement Task Force, Ranch Technologies and NM Land Office</i>	\$40,000 3/90-12/95
L.A. Torell	<i>1992-1993 Grazing Fee Test - USDA/Cooperative State Research Service</i>	\$65,520 10/92-9/93

Related Team Efforts

Range Improvement Task Force (college-wide group)

Special Facilities and Holdings

Dataset: only western state with ongoing annual ranch budget information, ranch values data, and grazing lease rate data

Paul R. Turner

Fishery and Wildlife Sciences
Agriculture and Home Economics
Box 30003 Dept. 4901 Knox 132
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Interests fisheries management, endangered species recovery

Publications

Turner, P.R., D.L. Propst, and J.A. Stefferud. 1992. Conservation and status of Gila trout, *Oncorhynchus gilae*. *Southwestern Naturalist*. 37:2: 117-125.

Research Support

P.R. Turner
P. Zwank

Evaluation of Habitat Restoration of Trout Streams in the Southwest -
INT/Fish and Wildlife Service

\$4,575
9/90-8/91

Raul Valdez

Fishery and Wildlife Sciences
Agriculture and Home Economics
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Interests wildlife ethology

Research Support

V. Howard
R. Valdez

Feral Horse Relationships to Vegetational Communities and Wildlife Habitat
in the Tularosa Basin, New Mexico - INT/Fish and Wildlife Service

\$63,410
7/93-10/94

Thom Votaw

Curriculum and Instruction
Education
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Phone 646-6273 FAX 646-5436 E-Mail tvotaw@nmsu.edu

Interests water quality monitoring project with high school students, environmental education particularly in developing countries

Publications

- Votaw, T.A., Hutto, Hadfield and Rios. 1990. Using Partnerships to Strengthen Elementary Science Education: A Guide for Rural Administrators. Southwest Educational Development Laboratory, Austin, TX.
- Votaw, T.A. 1990. Your nose can lead you home. Idea Sparkers #86, *Childhood Ed.* 65:5
- Votaw, T.A. 1990. A model for enhancing science instruction in middle schools. Panel Discussion, National Science Teachers Association Conference, Atlanta, GA.
- Votaw, T.A. 1990. Mandates, guides, texts and evaluation: All in a two hour course? National Science Teachers Association Conference, Atlanta, GA.

Research Support

T.A. Votaw
E. Thaeler
(Vista Middle School)
B. Votaw
(Las Cruces Public
Schools)

Capturing the Future (institute for middle school teachers to learn about science, technology, and society) - NM Commission for Higher Education

\$39,600
summer 1992

T.A. Votaw

Enhancing Science and Math Methods Courses through Use of Manipulatives - US Department of Energy

\$10,000
9/92-9/94

Foreign Experience

Votaw participated in a faculty exchange program with the Univ. of Waikato, New Zealand. Votaw resided in New Zealand fall 1992 while Dr. M. Barker of the Univ. of Waikato resided at NMSU.

Votaw is part of a five-member team from Curriculum and Instruction that wrote a grant to USAID and was funded to assist in the preparation of secondary teachers from the Commonwealth of Dominica. The two-year grant was for \$750,000.

Votaw went to Dominica with Dr. P. Huntsberger of CIP in May 1993 to discuss the grant with officials. As a follow-up to the USAID grant, C. White of Curriculum and Instruction, T. Dormody of Agri. Extension, and Votaw submitted a

concept paper to the John D. and Catherine T. MacArthur Foundation for environmental education for Dominica. The proposal is for \$400,000 and has been endorsed by the Prime Minister, Minister of Education, and Minister of Tourism and Conservation.

T. Dormody and Votaw visited Dominica in late March 1994 to discuss the possibilities of environmental education with officials there.

In June 1994 Votaw traveled to Trinidad, West Indies to participate in a pilot program sponsored by Earth Water and UNESCO. The project involved working with secondary school educators on curriculum development in agriscience ecology and environmental tourism.

Related Team Efforts

Capturing the Future: A project funded by the CHE for \$39,600 to conduct a summer 1992 institute for middle school teachers to learn about science, technology, and society (a near synonym for environmental education). Votaw was principal investigator and course instructor; collaborators include E. Thaeler (Vista Middle School) and B. Votaw (Las Cruces Public Schools).

John J. Waelti

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Interests natural resource economics

Publications

- Waelti, J.J. 1992. Elements of a Rural Economic Development Strategy. Dept. of Ag. Econ. and Ag. Bus.
Waelti, J.J. and J.T. Peach. 1992. Out of recession and into a prosperous 21st century: What it takes. *Choice*. Third Quarter, pp. 4-7.
Waelti, J.J. and A.D. Waldo. 1992. Macroeconomic Trends and Their Implications for Local Economic Development. Dept. of Agricultural and Applied Economics. Univ. of Minnesota, St. Paul, MN. Staff Paper P92-5.

Research Support

J.J. Waelti	<i>Farmland and Rangeland Assessment in New Mexico Based on Income-generating Potential - NM Taxation and Revenue Department</i>	\$3,000 10/92-12/92
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Foreign Experience

Waelti traveled to Poland in September 1992 to teach aspects of economic theory.
Waelti along with H. Matteson, D. Matthews, and J. Kemp traveled to Moscow and Kazakhstan in February 1994 to initiate cooperation in the areas of agriculture, natural resources, and the environment.

Joseph Wang

Chemistry and Biochemistry
Arts and Sciences
Box 30001 Dept. 3C Chemistry 138
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Interests analytical chemistry, electro-chemical techniques, clinical and environmental monitoring, electroanalysis

- Publications** (the following is a list of selected publications taken from Wang's more than 280 publications)
Buiz, R., E. Dempsey, C. Hua, M. Smyth, and J. Wang. 1993. Development of amperometric sensors for choline, acetylcholine and arsenocholine. *Anal. Chim. Acta*. 273:425.
Chen, L., Z. Taha, and J. Wang. 1992. Modified graphite composite electrodes for fixed potential amperometric detection of carbohydrates. *Current Separations*. 11:13.

- Chen, Q., J. Wang, G. Rayson, B. Tian, and Y. Lin. 1993. Sensor array for carbohydrates and amino acids based on electrocatalytic modified electrodes. *Anal. Chem.* 65:251.
- Dempsey, E., J. Wang and M. Smyth. 1993. Preparation of a L-lactate biosensor based immobilization of L-lactate oxidase within an electropolymerized o-phenylenediamine film. *Talanta.* 40:445.
- Dempsey, E., C. O'Sullivan, M. Smyth, D. Egan, R. Kennedy, and J. Wang. 1993. Development of an antibody-based amperometric biosensor to study the reaction of 7-hydroxycoumarin with its specific antibody. *Analyt.* 119:411.
- Dempsey, E., C. O'Sullivan, M. Smyth, D. Egan, R. Kennedy, and J. Wang. 1993. Voltammetric determination of hydroxycoumarin urine. *J. Pharm. Sci.* 11:443.
- Diamond, D., J. Lu, Q. Chen, and J. Wang. 1993. Multicomponent BIA using an array of ion selective electrodes. *Anal. Chim. Acta.* 282:629.
- Liu, F., A. Reviejo, J. Pingarron, and J. Wang. 1993. Development of an amperometric biosensor for determination of phenolic compounds in reversed micelles. *Talanta.* (In press).
- Lu, J., Q. Chen, D. Diamond, and J. Wang. 1993. Inverted PVC-liquid membrane ISEs for high speed batch injection potentiometric analysis. *Analyt.* 118:1131.
- Setiadji, R., J. Wang, and G. Santana-Rios. 1993. Determination of trace thorium using catalytic-adsorptive stripping voltammetry of the thorium-cupferron complex. *Talanta.* 40:845.
- Wang, J. and Y. Lin. 1994. Electrocatalytic flow detection of amino acids at ruthenium dioxide modified electrodes. *Electroanalysis.* 6:125.
- Wang, J., E. Suchman, and B. Tian. 1994. Direct measurements of copper in blood using stripping potentiometry at gold microelectrodes. *Anal. Chim. Acta.* 286:189.
- Wang, J. and E.G. Romero. 1993. Amperometric biosensing of alcohols at electrochemically pretreated glassy carbon enzyme electrodes. *Electroanalysis.* (In press).
- Wang, J., N. Naser and D. Lopez. 1993. Organic-phase biosensing of secondary alcohols with ADH electrode. *Biosensors.* (In press).
- Wang, J., B. Tian, and R. Setiadji. 1993. Disposable electrodes for field screening of trace uranium. *Electroanalysis.* (In press).
- Wang, J. and J. Lu. 1993. Adsorptive stripping voltammetric determination of trace tellurium in the presence of oxine. *Electroanalysis.* (In press).
- Wang, J., J. Lu, B. Tian, and C. Yarnitzky. 1993. Screen-printed ultramicroelectrode arrays for on-site stripping measurements of trace metals. *J. Electroanal. Chem.* (In press).
- Wang, J. and N. Naser. 1993. Improved performance of carbon paste amperometric biosensors through the incorporation of fumed silica. *Electroanalysis.* (In press).
- Wang, J., F. Lu, and D. Lopez. 1993. Tyrosinase-based ruthenium dispersed carbon paste biosensor for phenols. *Biosensor and Bioelectron.* (In press).
- Wang, J., F. Lu, and D. Lopez. 1993. Amperometric biosensor for phenols based on a tyrosinase/graphite-epoxy biocomposite. *Analyt.* (In press).
- Wang, J. and L. Chen. 1993. Small volume batch injection analyzer. *Analyt.* (In press).
- Wang, J., V. Granstaff, J. Lu and H. Tobias. 1993. Monitoring of metal concentration in plating rinse tanks using stripping voltammetry. (Submitted).
- Wang, J. and Y. Lin. 1993. On-line organic-phase enzyme detector. *Anal. Chim. Acta.* 271:53.
- Wang, J. and L. Angnes. 1993. Batch injection spectroscopy. *Anal. Letters.* 26:2329.
- Wang, J., Y. Lin, and Q. Chen. 1993. Organic-phase biosensors on the entrapment of enzymes with Eastman AQ coatings. *Electroanalysis.* 5:23.
- Wang, J., J. Lu, and R. Setiadji. 1993. Adsorptive stripping measurements of trace aluminum. *Talanta.* 40:351.
- Wang, J., A. Reviejo, and L. Angnes. 1993. Graphite-teflon enzyme electrode. *Electroanalysis.* 5:575.
- Wang, J., Y. Lin, A. Eremenko, and I. Kurochkin. 1993. Affinity biosensors based on preconcentration/voltammetry. Detection of phenothiazine drugs at LB Films of Th. *Anal. Chem.* 65:513.
- Wang, J., Y. Lin, and E. Eremenko. 1993. A laccase electrode for organic-phase enzymatic assays. *Anal. Lett.* 26:197.
- Wang, J. and J. Lu. 1993. Ultratrace measurements of selenium by cathodic stripping voltammetry in the presence of rhodium. *Anal. Chim. Acta.* 274:219.
- Wang, J., E. Romero, and A. Reviejo. 1993. Improved alcohol biosensor based on Ru-dispersed carbon paste enzyme electrodes. *J. Electroanal. Chem.* 353:113.
- Wang, J., Y. Lin and L. Chen. 1993. Organic-phase biosensors for assays of pharmaceutical products. *Analyt.* 118:277.
- Wang, J. 1993. Organic-phase biosensors—New tools for flow analysis. *Talanta.* 40:1905.
- Wang, J. 1993. Electroanalysis and biosensors. *Anal. Chem.* 65:450R.
- Wang, J. and T. Baomin. 1993. Screen printed electrodes for stripping measurements of trace mercury. *Anal. Chim. Acta.* 274:1.
- Wang, J. and J. Reviejo. 1993. Organic-phase enzyme electrode for the determination of trace water in non-aqueous media. *Anal. Chem.* 65:845.

- Wang, J. and B. Tian. 1993. Mercury-free disposable lead sensors. *Anal. Chem.* 65:1529.
- Wang, J., N. Naser, and C. Renschler. 1993. Enzyme nanoband electrodes. *Anal. Letters* (Special Issue). 26:1333.
- Wang, J., J. Lu, and C. Yarnitzky. 1993. Highly sensitive and selective measurements of lead by stripping voltammetry/potentiometry following adsorptive accumulation of the lead OCP complex. *Anal. Chim. Acta.* 280:61.
- Wang, J. and B. Tian. 1993. Gold ultramicroelectrodes for on-site monitoring of trace lead. *Electroanalysis* (Special Issue). 5:809.
- Wang, J., N. Naser, and U. Wollenberger. 1993. Use of tyrosinase for enzymatic elimination of acetaminophen interference in amperometric sensing. *Anal. Chim. Acta.* 281:19.
- Wang, J., E. Dempsey, A. Eremenko, and M. Smyth. 1993. Organic-phase biosensing of enzyme inhibitors. *Anal. Chim. Acta.* 279:203.
- Wang, J., L. Fang, D. Lopez, and H. Tobias. 1993. Highly selective and sensitive amperometric biosensing of glucose at ruthenium-dispersed carbon paste enzyme electrodes. *Anal. Letter.* (In press).
- Wang, J. and A. Reviejo. 1993. Enzymatic assays of organic peroxides in microemulsion systems. *Analyst.* 118:1149.
- Wang, J., L. Angnes, H. Tobias, K. Hong, R. Glass, and R. Pekela. 1993. Carbon aerogel composite electrodes. *Anal. Chem.* 65:2300.
- Wang, J. and H. Wu. 1993. Permselective lipid/PPD coatings for amperometric biosensing of glucose. *Anal. Chim. Acta.* 283:683.
- Wang, J. and Q. Chen. 1993. In-situ elimination of metal inhibitory effects using ligand-containing carbon paste electrodes. *Anal. Chem.* 65:2698.
- Wang, J. and J. Lu. 1993. Adsorptive stripping voltammetry of trace thallium. *Anal. Chim. Acta.* 282:329.
- Wang, J. and J. Lu. 1993. Fumed-silica containing carbon paste dehydrogenase biosensors. *Anal. Chim. Acta.* 284:385.
- Wang, J., H. Wu, and L. Angnes. 1993. On-line monitoring of hydrophobic compounds at self-assembled monolayer modified amperometric flow detectors. *Anal. Chem.* 65:1893.
- Wang, J., J. Reviejo, and S. Mannino. 1992. Organic-phase enzyme electrode for the determination of phenols in olive oils. *Anal. Letters.* 25:1399.
- Wang, J. and N. Naser. 1992. Tissue bioreactor for eliminating interferences in flow analysis. *Anal. Chem.* 64:2469.
- Wang, J. and B. Tian. 1992. Trace measurements of beryllium by adsorptive stripping voltammetry and potentiometry. *Anal. Chim. Acta.* 270:137.
- Wang, J., J. Lu and K. Olsen. 1992. Ultratrace measurements of chromium by adsorptive-catalytic stripping voltammetry in the presence of cupferron. *Analyst.* 117:1913.
- Wang, J., L. Angnes, and T. Martinez. 1992. Scanning tunneling microscopic probing of surface fouling during the oxidation of NADH. *Bioelectrochem. Bioenerg.* 29:215.
- Yarnitzky, C., J. Wang, and B. Tian. 1993. Hand-held lead analyzer. *Talanta.* (In press).

Research Support

J. Wang	<i>Metal Sensors</i> - Sandia National Laboratories	\$25,000
J. Wang	<i>Peroxide Sensors</i> - Environmental Protection Agency	\$220,000
J. Wang	<i>Chromium Sensor</i> - BRS	\$36,000
J. Wang	<i>Field Sensors</i> - Battelle	\$40,000
J. Wang	<i>Biosensors</i> - NIH-MBRS	\$80,000
J. Wang	<i>Characterization of the Electrochemical Response of Carbon-based Sensors</i> - Sandia National Laboratories	\$40,068 12/92-9/94
J. Wang	<i>Lead Sensors</i> - NIH-CDC	\$300,000
J. Wang	<i>Development of an Organic-phase Biosensor for Trace Water</i> - Dow Chemical (proposal submitted)	\$42,640 1/94-12/94

Foreign Experience

Two plenary lectures will be presented by Wang at major international conferences 1-Euroanalysis and 2-Eirelect-1993. Wang traveled to Lund, Sweden and Copenhagen, Denmark in June 1993 to present two plenary lectures, attend committee meetings on joint student-University of Copenhagen relations, and visit Nova Nordisk. Wang hosted a visiting scientist from Dublin City University, Ireland from 12/15/92 to 4/15/93. They collaborated on chemical sensors.

Wang was awarded a Visiting Scientist Fellowship to the People's Republic of China from the US Academy of Sciences in 1986, and received the Young Faculty Award of the Society of Analytical Chemists of Pittsburgh in 1981. Wang has made plenary lectures at 20 international conferences.

Wang visited Wollongong and Melbourne, Australia to present two keynote lectures at the Australia Electrochemistry Conference.

Wang traveled to Parma, Italy and Graz, Austria in October 1993 to present seminars on "Advanced Amperometric Sensors."

Special Facilities and Holdings

Equipment: on-line monitors for metals

Frank A. Ward

Agricultural Economics and Agricultural Business

Agriculture and Home Economics

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Interests resource economics, welfare economics, wildlife management, recreation, renewable resource management, fisheries, computer models

Publications

Cole, R.A., F.A. Ward, T.J. Ward, and R.M. Wilson. 1990. Development of an interdisciplinary planning model for water and fishery management. *Water Resources Bull.* 26:4:597-609.

Cole, R.A., F.A. Ward, T.J. Ward, R.A. Deitner, S.M. Bolton, and J. Fiore. 1990. *Analysis of Central Arizona Angler Opportunity and Benefits Gained by Installing Artificial Habitat in Saguaro Lake, Based on Adaptation of the Comprehensive Management Planning Model, RIOFISH.* Completion Rep. for Tonto National Forest, US Forest Service, USDA.

Cole, R.A., F.A. Ward, T.J. Ward, S. Bolton, R.A. Deitner, and J. Fiore. 1990. *User's Guide for RIOFISH—A Fishery Management Model for Large New Mexico Reservoirs.* NM Water Resources Research Institute Tech. Completion Report No. 252. NMSU. Las Cruces, NM.

Cole, R.A. T.J. Ward, F.A. Ward, R.A. Deitner, S. Bolton, and K. Green-Hammond. 1990. *RIOFISH, A Fishery Management Planning Model for New Mexico Reservoirs.* NM Water Resources Research Institute Tech. Completion Rep. No. 253. NMSU. Las Cruces, NM.

Ward, F.A., and J. Fiore. 1991. A model of the welfare effects of changes in quality: New Mexico fishing. Western Regional Research Publication W-133. 4th Interim Report. Univ. of CA/Davis.

Ward, F.A. and J. Kerkvliet. Quantifying exhaustible resource theory: application to mineral taxation policy. *Resources and Energy.* (In press).

Research Support

R.A. Cole	<i>Development of Policy Analytical Tools for Fish and Wildlife Management</i>	\$570,000
F.A. Ward	<i>in New Mexico - NM Department of Game and Fish</i>	\$30,000
T.J. Ward		(WRR)

F.A. Ward	<i>Regional Recreation Demand Model - US Army Corps of Engineers</i>	\$130,000
J. Loanis		FY 91-92
(UC Davis)		
R. Ready		
(Univ. KY)		

F.A. Ward	<i>Renewable Resource Management in New Mexico - NM Agricultural</i>	\$2,500
J. Doll	<i>Experiment Station</i>	

F.A. Ward	<i>Benefit Cost Analysis in Natural Resources Planning - NM Agricultural</i>	\$2,500
	<i>Experiment Station and USDA</i>	

F.A. Ward	<i>Regional Recreation Demand Model - USDA/Cooperative State Research Service</i>	\$368,000 7/91-9/94
R.A. Cole F.A. Ward T.J. Ward	<i>Comprehensive Resource Planning and Research - RIOFISH - NM Water Resources Research Institute</i>	\$130,000 9/93-7/94
J.P. King F.A. Ward	<i>Economic Optimization of River Management Using Genetic Algorithms - NM Water Resources Research Institute (proposal submitted)</i>	\$24,576 7/94-6/95
R.A. Cole F.A. Ward T.J. Ward	<i>Management Model of Watershed Condition, Water Resources, and Recreation Value - USDA/Cooperative State Research Service (proposal submitted)</i>	\$339,593 10/94-9/97

Related Team Efforts

Benefits and Costs in Natural Resource Planning (national, with approximately 20 universities around U.S., mostly economists); Regional Recreation Demand Model - developing a national model for US Army Corps of Engineers to assess recreation benefits of water policy in conjunction with UC Davis and Univ. of KY

Special Facilities and Holdings

Datasets: NM Fishing demands by fishing site, season and year, 1988-1992
Software: RIOFISH: computer model to conduct cost-benefit analysis of fisheries policies

Tim J. Ward

Civil, Agricultural and Geological Engineering
Engineering
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Phone 646-3232 FAX 646-6049 E-Mail

Interests surface water hydrology, erosion and sediment transport, surface water transport of contaminants, mathematical modeling of hydrologic/hydraulic processes

Publications

- Bolton, S.M., T.J. Ward, and R.A. Cole. 1991. Sediment-related transport of nutrients from southwestern watersheds. *J. Irr. Drainage Engineering*. ASCE. 117:5.
- Gosz, J.R., D.I. Moore, H.D. Grover, W. Rison, C. Rison, T.J. Ward, K.A. Stevens, and S. Bolton. 1992. *Analysis of Relationships Between Lightning, Precipitation and Runoff*. NM Water Resources Research Institute Technical Completion Report No. 276.
- Ward, T.J. 1992. *Data Summary Report for Rainfall Simulation to Estimate Potential Sediment Loadings to the Albuquerque North Diversion Channel*. Prepared for US Army Corps of Engineers, Albuquerque District, October 1992.
- Ward, T.J. and S.M. Bolton. 1991. *Hydrologic Parameters for Selected Soils in Arizona and New Mexico as Determined by Rainfall Simulation*. NM Water Resources Research Institute Technical Completion Report No 276.

Research Support

T.J. Ward	<i>Erosion Risk Modeling Task - Depleted Uranium Risk Assessment Yuma Proving Ground - Los Alamos National Laboratory</i>	\$45,000
T.J. Ward J. Gosz (UNM) R. Aguilar (UNM)	<i>Sewage Sludge Application in Semiarid Grasslands: Effects on Soils, Vegetation, and Water Quality (Ward will do the rainfall simulation and data analysis) - NM Water Resources Research Institute</i>	\$25,000
T.J. Ward	<i>Review of Channel Morphology vs Streamflow Relations at Effective Discharge for the Forest Service Arizona Watershed Studies - USDA Forest Service</i>	\$50,000 9/92-12/92

T.J. Ward	<i>Rainfall Simulation to Estimate Potential Sediment Loadings to the Albuquerque North Diversion Channel - US Army Corps of Engineers, Albuquerque District</i>	\$12,500 9/92-11/92
T.J. Ward	<i>Large Area Rainfall Simulation on Sewage Sludge Amended and Natural Grassland Plots, Fort Collins, CO - Ft. Collins, CO</i>	\$7,270 8/92-12/92
T.J. Ward R. Cole F. Ward	<i>Evaluation of Procedures for Developing and Applying Policy Analytical Tools for Fish and Wildlife Management in NM - NM Department of Game and Fish and NM Water Resources Research Institute</i>	\$1,252,750 5/92-11/93
T.J. Ward J. Gosz (UNM) D. Moore (UNM) W. Rison (NMTECH)	<i>Analysis of Relationships Between Lightning, Precipitation and Runoff - NM Water Resources Research Institute</i>	\$74,258 5/90-6/92
T.J. Ward	<i>Factors Influencing the Downslope Delivery of Landslide Material - NM Water Resources Research Institute</i>	\$9,991 10/90-9/91
R.A. Cole F.A. Ward T.J. Ward	<i>Comprehensive Resource Planning and Research - RIOFISH - NM Water Resources Research Institute</i>	\$130,000 9/93-7/94
W. Zachritz T.J. Ward	<i>Environmental Assessment of Highly Disturbed Watersheds Resulting from Coal Mining in Santa Catarina, Brazil - Inter-American Development Bank (proposal submitted)</i>	\$196,635 1/94-7/95
R.A. Cole F.A. Ward T.J. Ward	<i>Management Model of Watershed Condition, Water Resources, and Recreation Value - USDA/Cooperative State Research Service (proposal submitted)</i>	\$339,593 10/94-9/97

Related Team Efforts

Ward is a participant in RIOFISH modeling team (intercollege); LTER-Jornada (intercollege); LTER-Sevilleta (intercollege); WERC - technical head of facilities

Foreign Experience

Ward traveled to Newcastle upon Tyne, United Kingdom, to work on modeling of large river basins. Ward along with W. Zachritz and H. Matteson traveled to Santa Catarina, Brazil to provide assistance to the Fundacao Educacional de Criciuma in the area of environmental contamination due to coal mining.

Special Facilities and Holdings

Facilities: LTER - Jornada and Sevilleta; SWAT (soil, air and water testing) part of WERC
 Equipment: 2 rainfall simulators - small area 1 x 1m and large area, about 400 square meters Hydraulics laboratory for testing hydrologic and hydraulic characteristics and natural and human created systems
 Datasets: LTER data sets
 Software: RIOFISH computer program for analyzing fisheries in NM

Kenneth R. White

Civil, Agricultural and Geological Engineering
 Engineering
 Box 30001 Dept. 3CE Engineering Complex II 202
 Phone 646-3801 FAX 646-6049 E-Mail

Interests surface transportation issues, bridges, state highway department

Publications

- Idriss, R.L. and K.R. White. 1991. Secondary load paths in bridge systems. Third Bridge Engineering Conf. Record No. 1290. Denver, CO. 1:194-201.
- McCarthy, W.C. and K.R. White. 1990. Bridge Cad: Computer software that drafts bridge plans. *Proc. 4th Intl Cong. on Engineering Computer Graphics and Descriptive Geometry*. Miami, FL.
- Minor, J. and K.R. White. 1990. Bridge Maintenance Inspection and Evaluation. 2nd Ed. New York and Basel: Marcel Dekker, Inc.
- White, K. 1990. Updating Your Bridge Rating Skills. Short School, University of Wisconsin, Madison, WI.

Research Support

K.R. White S.P. Maggard J. Minor	<i>Bridge Inspection for New Mexico</i> - NM State Highway and Transportation Department	\$350,000/yr
K.R. White J. Minor S.P. Maggard	<i>Bridge Inspection Training</i> - various agencies	\$60,000/yr
K.R. White J. Minor	<i>Bridge Non-destructive Testing Program</i> - NM State Highway and Transportation Department/National Science Foundation	\$500,000
K.R. White S. Maggard	<i>Bridge Inspection Program for New Mexico 1991-1992</i> - NM State Highway Transportation Department	\$297,885 7/91-6/92
L. Matthews K.R. White	<i>Testing of I-40 Bridges Spanning the Rio Grande River</i> - National Science Foundation	\$49,962 9/92-2/94
K.R. White	<i>Non-destructive Bridge Testing</i>	\$60,000 6/92-12/93
K.R. White R. Schoenmackers	<i>Development of a National Traffic Monitoring Device Testing Plan</i> - NM Highway and Transportation Department	\$250,000 8/93-1/95
K.R. White J. Minor	<i>Bridge Inspection Program for New Mexico</i> - NM State Highway and Transportation Department (proposal submitted)	\$380,702 7/94-6/95

Related Team Efforts

Alliance for Transportation Research (national level)

Special Facilities and Holdings

Software: Bridge Analysis and Capacity Rating

James D. Williams

Sociology and Anthropology
Arts and Sciences

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Phone 646-2416 FAX 646-3725 E-Mail

Interests demography, rural sociology, survey research

Research Support

J.D. Williams	<i>Community Development Block Grant Low-mod Status Survey</i> - City of Las Cruces	\$12,630 3/93-6/93
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James C. Witcher

Southwest Technology Development Institute

Engineering

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Phone 646-3949 FAX 646-2960 E-Mail

Interests geothermal energy resources, radon occurrence and transport, radon geology, groundwater resources and chemical quality, exploratory geology and geophysics, geologic mapping, aqueous geochemistry, terrestrial heat flow, hydrogeology, environmental geology

Publications

- Fischer, C.L., J. Whittier, J.C. Witcher and R. Schoenmackers. 1990. An economic evaluation of southern New Mexico's low-temperature geothermal resources. *Transactions*. Geothermal Resources Council. 14:1:495-598.
- Fischer, C.L., R. Foster, M. Heller Turietta, J. Whittier, J.C. Witcher and W.H. Zachritz. 1990. *New Mexico Economic Development and Geothermal Resources: Potential Industry Applications*. New Mexico Energy, Mineral and Natural Resources Department Report EMNRD 77-521.31-121.
- Fischer, C.L., J. Whittier, J.C. Witcher and R. Schoenmackers. 1990. *Southern New Mexico Low-Temperature Geothermal Resource Economic Analysis*. New Mexico Research and Development Institute Report NMRDI 2-78-5202/II.
- Foster, R.E., C.L. Fischer and J.C. Witcher. 1991. *An Economic and Engineering Feasibility Assessment of the Proposed Ironhorse Railroad for Lincoln County, New Mexico: Part I—Engineering Analysis*. Southwest Technology Development Institute Technical Report.
- Whittier, J., R. Schoenmackers and J.C. Witcher. 1991. Geothermal direct-use - A successful example of green house heating in New Mexico. *Transactions*. Geothermal Resources Council. 15:73-76.
- Witcher, J.C. 1992. A geologic framework for geothermal systems in the southern basin and range province and southern Rio Grande Rift, New Mexico. *Proceedings Volume*. Spring Meeting. New Mexico Geological Society. Socorro, NM. p. 17.
- Witcher, J.C., M. Reiter, D. Bland and M.W. Barroll. 1992. Geothermal resources in New Mexico. *New Mexico Geology*. New Mexico Bureau of Mines and Mineral Resources. 14:1:14-16.
- Witcher, J.C., M. Heller Turietta and C.L. Fischer. 1992. Geothermal Resources at the Jemez Pueblos: Phase 2—Reservoir Assessment and Feasibility of Geothermal Applications. Final Report, Southwest Technology Development Institute, prepared for Council of Energy Resource Tribes.
- Witcher, J.C. 1992. *Geologic Logs of NMSU Landfill Monitor Wells*. Southwest Technology Development Institute. Prepared for NMSU Physical Plant Department.
- Witcher, J.C. 1992. A geologic framework for geothermal systems in the southern basin and range province and the southern Rio Grande Rift, New Mexico. *NM Geol.* 14:3:62.
- Witcher, J.C. 1991. The Rincon geothermal system, southern Rio Grande rift, New Mexico: A preliminary report on a recent discovery. *Transactions*. Geothermal Resources Council. 15:205-212.
- Witcher, J.C. 1991. Radon soil-gas surveys with diffusion-model corrections in geothermal exploration. *Transactions*. Geothermal Resources Council. 15:301-308.
- Witcher, J.C. 1991. A diffusion for radon soil-gas survey interpretation. *Geological Society of America Abstracts*. Rocky Mountain Section. 23:4:107.
- Witcher, J.C. 1991. *Jemez Pueblo Geothermal Assessment*. Technology Enterprise Division, New Mexico Economic Development Department Report 2-78-5206.
- Witcher, J.C., J. Whittier and R. Morgan. 1990. New Mexico geothermal data base. *Transactions*. Geothermal Resources Council. 14:1:513-518.
- Witcher, J.C. 1990. *A Geologic and Hydrogeologic Inventory of the NMSU Landfill Area*. Southwest Technology Development Institute report. Prepared for NMSU Physical Plant Department.
- Witcher, J.C. and R. Schoenmackers. 1990. *Time-Integrated Radon Soil-Gas Surveys in Geothermal Exploration in the Southern Rio Grande Rift: Final Report*. Southwest Technology Development Institute. Prepared for US Department of Energy Contract No. DEFG07-88ID12794, and New Mexico Research and Development Institute Contract No. 2-77-5206.

Research Support

J.C. Witcher R. Schoenmackers along with Univ. of Utah Research Institute Earth Science Lab and Oregon Institute of Tech. Geo-Heat Center	<i>Geothermal Energy Research in New Mexico and Arizona</i> - US Department of Energy	
J.C. Witcher	<i>Geothermal Studies at Rincon</i> - various sources	
J.C. Witcher H.P. Ross (Univ. Utah)	<i>Self-potential Geophysical Studies over Rio Grande Rift Geothermal Systems</i> - US Department of Energy	
J.C. Witcher	<i>State Geothermal Energy Research, Development, and Database Compilation</i> - Oregon Institute of Technology	\$59,992 7/92-12/93
J.C. Witcher	<i>Geothermal Geotechnical Services for Alpine-Springerville Area Geothermal Project</i> - Tonto Drilling Services, Inc.	\$79,532 5/93-2/94

Related Team Efforts

US Department of Energy - Geothermal Division Low-Temperature Geothermal Resources and Technology Transfer Program - geothermal characterization of the western US

Special Facilities and Holdings

Equipment:	high precision thermister temperature probe, cable, and depth counter
Bibliographies:	Geothermal Resources of Arizona Geothermal Resources of New Mexico (for inspection only)
Datasets:	Comprehensive geothermal data compilations for New Mexico and Arizona. Data include chemical analysis, geology, temperature, logs, geothermal uses facilities, reservoir information, surveys available on a site-specific basis (also radon emanation data for soils, Dona Ana County)
Software:	New Mexico Geothermal Data Base (Dbase IV)
Other:	geologic samples from geothermal wells and heat flow holes in New Mexico

M. Karl Wood

Animal and Range Sciences
Agriculture and Home Economics
Box 30003 Dept. 3-I
Phone 646-1041 FAX 646-5441 E-Mail kwood@nmsu.edu

Interests range management, forest watershed management

Publications

Wood, M.K., H. Rubio, and M. Cardenas. 1992. The effect of polyacrylamide on grass emergence under field conditions in southcentral New Mexico. *J. Range Mgmt.* 45:3:296-300.

Research Support

M.K. Wood	<i>Shrub Breeding - Hamdy Oushy</i> - San Diego State University Foundation	\$600 1/91-1/92
M.K. Wood P. Turner	<i>Monitoring Project of the Main Diamond Watershed, Black Range Ranger District</i> - USDA Forest Service	\$2,135 7/91-10/91
M.K. Wood	<i>Watershed Condition in Main Diamond Canyon, Gila National Forest</i> - USDA Forest Service	\$2,000 7/93-9/93

Foreign Experience

Wood has experience in Mexico, South Africa, Lesotho, Kenya, Sudan, Egypt, Pakistan, England, and Ireland.

Related Team Efforts

Range Improvement Task Force

Susan Wright

Home Economics Program Unit

Agriculture and Home Economics

Box 30003 Dept. 3AE Gerald Thomas 312

Phone 646-3306 FAX 646-5975 E-Mail suwright@nmsu.edu

Interests

solid waste management, water quality, environment education for youth and children

Publications

Wright, S. 1992. Junk Your Junkmail. NMSU Coop. Ext. Serv. Guide G-107.

Wright, S. 1992. Reduce - Reuse - Recycle: Alternatives for Waste Management. Coop. Ext. Serv. Guide G-314.

Wright, S. 1992. Safe Use and Disposal of Household Chemicals. Coop. Ext. Serv. Guide G-312.

Wright, S. 1992. Household Hazardous Waste. Coop. Ext. Serv. Guide G-313.

Wright, S. 1992. Alternatives to Household Hazardous Chemicals. Coop. Ext. Serv. Guide G-315.

Wright, S.E. 1990. Safe Water in the Home. NMSU Coop. Ext. Serv. Guide M-108.

Research Support

S. Wright

Extension Specialist in Solid Waste Management; Coordinate Solid Waste Management Education Program for Cooperative Extension Service

Related Team Efforts

Cooperating with NM Department of Energy, Minerals and Natural Resources, NM Environment Department and NM Highway Department: Keep NM Clean and Beautiful will establish an educational materials clearinghouse for environment education. Materials will be available to teachers, extension agents, and other educators throughout the state.

Walter H. Zachritz

Southwest Technology Development Institute

Engineering

Box 30001 Dept. 3SOL

Phone 646-2856 FAX 646-2960 E-Mail

Interests

environmental engineering, biology

Publications

Zachritz II, W.H., L. Lundie, and H. Wang. 1993. *Preliminary Characterization of Chlorophenol Degradation by Artificial Wetland Filter (AWF) Systems*. Final year 2 Report submitted to the Southwest Center for Environmental Research and Policy, El Paso, TX.

Zachritz II, W.H. and R.B. Jacquez. 1993. Treating intensive aquaculture recycle water using artificial wetlands filters. *Constructed Wetlands for Water Quality Improvement*. G.A. Moshiri (ed.), Lewis Publishers, Chelsea, MI.

Zachritz II, W.H., L. Lundie, and H. Wang. 1993. *Characterization of Benzoate Degradation by and Microbial Ecology of Artificial Wetland Filter (AWF) Systems*. Final year 1 report submitted to the Southwest Center for Environmental Research and Policy, El Paso, TX.

Zachritz II, W.H. 1993. Performance attributes of large-scale subsurface flow wetland systems for domestic wastewater treatment. *Proceedings of USEPA Sponsored Subsurface Flow Constructed Wetlands Conference*. August 16-17, El Paso, TX.

Zachritz II, W.H., L. Lundie, and N.N. Khandan. 1993. Constructed wetlands systems for advanced treatment of complex organic wastewaters. *Proceedings of the Second USA/CIS Joint Conference on Environmental Hydrology and Hydrogeology*. May 16-21, Washington, DC.

- Zachritz II, W.H. and W.J. Fuller. 1993. Performance of an artificial wetlands filter treating facultative lagoon effluent at Carville, Louisiana. *Water Environment Research*. 65:1.
- Zachritz, W.H., L. Lundie, R.B. Jacquez, and B.S. Martinez. 1992. *Waste Management Characterization of Turpene-Based Solvent Substitutes for Electronic Circuit Board Manufacturing at Sandia National Laboratories*. Final rpt. Sandia Nat'l Labs. Albuquerque, NM.

Research Support

W.H. Zachritz R. Jacquez	<i>Analysis of Biodegradability of Selected Solvent Substitutes</i> - Sandia National Laboratories	\$39,977 11/93-11/94
R. Berghage W. Mueller W.H. Zachritz	<i>Agricultural Wastewater Remediation Using Artificial Wetlands Filters</i> - USDA/Cooperative State Research Service (proposal submitted)	\$125,799 7/93-8/95
W.H. Zachritz T.J. Ward	<i>Environmental Assessment of Highly Disturbed Watersheds Resulting from Coal Mining in Santa Catarina, Brazil</i> - Inter-American Development Bank (proposal submitted)	\$196,635 1/94-7/95
W.H. Zachritz	<i>Literature Review of Onsite Treatment Systems</i> - Bernalillo Public Health Department	\$4,990 10/93
W.H. Zachritz	<i>Assessment of Wood Pellets for Selected Sites in New Mexico</i> - WERP	\$30,000 10/93
W.H. Zachritz	<i>Preliminary Review of Environmental Regulations for a Biomass Energy Facility in New Mexico</i> - NEOS Corporation	\$6,975 11/93
W.H. Zachritz	<i>Waste Management Properties of Solvent Substitutes</i> - Sandia National Laboratories	\$39,000 11/93
W.H. Zachritz	<i>Energy Policy Act Study</i> - US Department of Energy	\$30,000 4/93
W.H. Zachritz	<i>Microtox as a Biomonitoring Tool for Whole Effluent Testing</i> - Los Alamos National Laboratory	\$27,000 3/93
W.H. Zachritz	<i>Enhancement of Existing Geothermal Resource Utilization by Cascading to Intensive Aquaculture</i> - US Department of Energy	\$206,000 3/93
W.H. Zachritz	<i>Artificial Wetlands as a Low-Cost Treatment Alternative for Complex Organic Wastewaters</i> - US Environmental Protection Agency	\$185,000 9/91-10/94

Foreign Experience

Zachritz along with T. Ward and H. Matteson traveled to Santa Catarina, Brazil to provide assistance to the Fundacao Educacional de Criciuma in the area of environmental contamination due to coal mining.

During 1980-81, Zachritz did a market study for the National Steel Company of Brazil (Siderbras) on galvanized steel products. From 1978-79 Zachritz was a visiting professor at the Universidade Federal Do Rio Grande Do Norte, Natal, Brasil. Duties included development of a baseline study to assess pollution sources and requirements for treatment processes in northeastern Brazil.

Zachritz also has been involved with Autonoma University, Juarez, Mexico on a constructed wetland wastewater treatment system.

Naida D. Zucker

Biology

Arts and Sciences

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Phone 646-1200 FAX 646-5665 E-Mail

Interests animal behavior, behavioral ecology, lizards, crustaceans**Publications**Zucker, N.D. 1994. A dual status-signalling system: A matter of redundancy or differing roles? *Anim. Behav.* 47:15-22..**Research Support**

N.D. Zucker	<i>Molecular Genetic Techniques: Testing Reproductive Success</i> - National Science Foundation	\$49,477 10/92-9/94
N.D. Zucker L. Mahrt	<i>Territorial and Related Defense Behavior in Female Tree Lizards, Urosaurus ornatus</i> - National Science Foundation (proposal submitted)	\$8,463 1/94-5/95

Phillip J. Zwank

Fishery and Wildlife Sciences

Agriculture and Home Economics

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Phone 646-5944 FAX 646-5975 E-Mail

Interests waterfowl biology**Publications**Mitchel, C.A., T.W. Custer, and P.J. Zwank. 1992. Redhead duck behavior on lower Laguna Madre and adjacent ponds of southern Texas. *Southwest Nat.* 37:1:65-72.Stallknecht, D.E., V.A. Senne, P.J. Zwank, S.M. Shane and M.T. Karney. 1991. Avian paramyxoviruses from migrating and resident ducks in coastal Louisiana. *J. Wildl. Dis.* 27:1:123-128.Vilella, R.J. and P.J. Zwank. 1993. On Mongooses and nightjars. *Carib J. Sci.* 29:1&2:24-29.Vilella, R.J., and P.J. Zwank. 1993. Geographical distribution and abundance of the Puerto Rican nightjar. *J. Field Ornithol.* 64:223-239.Zwank, P.J., J.A. Zeno and J.A. Jenks. 1993. Birth characteristics and body growth of white-tailed deer fawns. *Louisiana Acad. Sci.* 55:15-20.Zwank, P.J. and K.W. Kroel. 1992. Renesting of Mexican spotted owl in southern New Mexico. *J. Raptor Res.* 26:4:173-174.**Research Support**

P.J. Zwank	<i>Distribution, Abundance and Ecological Association of Mexican Spotted Owls in Mexico</i> - INT/Fish and Wildlife Service	\$33,000 5/91-12/92
P.J. Zwank	<i>Ecological Studies at Ft. Bliss McGregor Range</i> - INT/Fish and Wildlife Service	\$443,401 7/92-5/95

Foreign Experience

Zwank gave a talk on flammulated owls in southern New Mexico at the International Wildlife Management Congress held in Costa Rica in September 1993.

Related Team Efforts

Zwank collaborates with B. Thompson and the faculty of Fishery and Wildlife Sciences which receives funding from the US Fish and Wildlife Service, US Army, Bureau of Reclamation, US Forest Service, NM Dept. of Game and Fish, Nature Conservancy and the Peregrine Fund.

KEYWORD INDEX

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