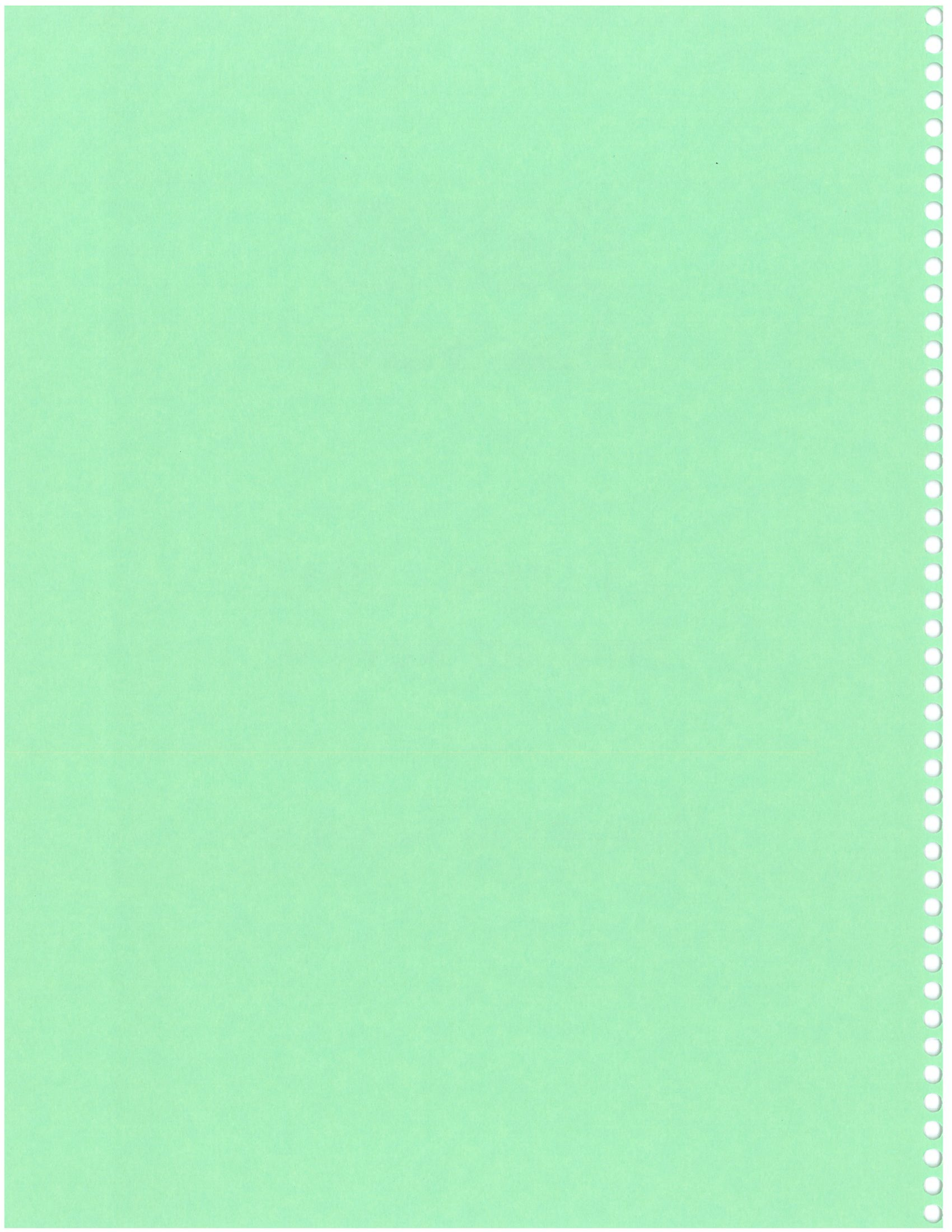




AY 2006 – 2007
Program Review

Biological Sciences



**Program Review
Department of Biological Sciences
Mesa State College, 2006**

A. OVERVIEW AND HISTORY

The Biology program began in 1974 as a two-year program with three faculty members. We now offer both Associate and Bachelor of Science degrees, as well as a minor in Biology. Within the BS program, we offer two concentrations, one in Biology and the other in Secondary Education Licensure. The program currently includes 12 tenured or tenure-track faculty, 3 full-time instructors and several adjunct instructors. The number of students majoring in the Biology concentration has grown steadily from 264 majors in 2002 to 321 majors in 2006. The number of students majoring in Biology with Teacher Licensure has remained steady with 22 majors in 2002 and 23 majors in 2006. The teacher education program had been radically changed during this time period. First, the Colorado Commission for Higher Education (CCHE) ruled that all programs, including teacher education programs, must be completed in 120 credit hours. The Biology licensure program had over 140 credit hours. The initial program change kept the biology course work intact while eliminating some of the chemistry, geology, and physics requirement. Unfortunately, Colorado licenses in Science, not Biology, and the program had to be modified again to cover the needed sciences. Now the teacher licensure program is strong in general science, but fairly weak in Biology. Students now pass their Praxis or PLACE exams (100% pass rate this last year), and obtain licensure.

In 1997, the new science laboratory building was completed, allowing expansion of our laboratory space from three to eight. Two laboratories of those laboratory spaces are now dedicated to student research, one for ecology/environmental studies and one for modern

molecular biology. The department also houses an electron microscopy center, greenhouse, animal facility and herbarium.

The department will provide support courses for a new minor in Forensics, which began in the Fall of 2006. Two new courses have been added to the Biology line-up, both with a laboratory component. A course in Criminalistics will provide a broad overview of forensic techniques, and is a required course for the Forensics minor. Additionally, a course in Forensic Molecular Biology will be an elective option for those interested in DNA techniques specifically.

On the financially side, the program is adequately funded, although some needs are currently unmet, such as increased technology needs in our laboratories, as well as the need for expensive modern molecular biology equipment and supplies. Lab fees instituted in 1998 have greatly improved our financial picture.

B. PROGRAM GOALS AND OBJECTIVES, AND RELATIONSHIP TO THE ROLE AND MISSION OF MESA STATE

Mesa State College's mission is found on our web site: "There is hereby established a College at Grand Junction, Colorado, to be known as Mesa State College, which shall be a general baccalaureate and specialized graduate institution with moderately selective admissions. Mesa State College shall offer liberal arts and sciences programs and a limited number of professional, technical, and graduate programs. Mesa State College shall also maintain a community college role and mission, including vocational and technical program." The Biology program goals fit in very well with the goals of the College. Our departmental mission is to develop and enrich the intellectual capabilities and potential of our students so that they can become competent biologist. Thus, the following goals and objectives are requisite for the intellectual development of our students and necessary to guide faculty performance.

- to provide students with a strong science background in areas allied with biology (chemistry, physics and mathematics)
- To provide students with a broad liberal arts education in biology that covers at least three of our four areas in Biology: cell, development and molecular; organismal; anatomical and physiological; and ecology, evolution, and systematics.
- to provide a means to enhance written and oral communication skills among biology majors
- to encourage students to participate in research activities and internship experiences that develop intellectual growth and relationships with the community
- to provide students with the opportunity to learn biological concepts and skills necessary for competition in the job market of the future
- to prepare students for successful competition in post baccalaureate training programs leading to scientific or medical careers
- to provide the means to allow for the training and acquisition of skills and knowledge necessary for careers in K-12 education
- to foster the development of citizenship among our students by exposing them to ecological, ethical, philosophical and humanistic issues relevant to improving the human condition in contemporary society
- to offer coursework and learning opportunities to students majoring in other disciplines allied to the biological sciences (i.e. Chemistry, Geology, Nursing, Physics, Environmental Studies, etc.)

C. ANALYSIS OF NEED FOR THE PROGRAM

Majors: Table 1 in the statistics section of Appendix 1 lists the unduplicated degree emphasis counts. Focusing only on the BS concentrations, the Biology concentration has steadily increased over the last 5 years from 242 to 298 while the Teacher Certification has held steady at around 22. There is clearly a need for the Program, based on increasing enrollments. Table 2 lists the undergraduate biology science enrollment by major, and also shows a steady increase over the last 5 years for the Biology majors. The Teacher Certification numbers show a drop from 27 to 18, which is likely due to the initial change in the program in Fall 2000. At that time, the number of credit hours was reduced from 142 to 123, per CCHE requirements. In 2005, the program in Teacher Certification was changed again for incoming freshman majors to provide more course work in the supporting sciences of chemistry, physics, and geology. Enrollments in teacher licensure have stabilized and may be increasing.

Enrollment: Tables 3, 4, and 5 present enrollment data from several perspectives. Table 3 gives the program summary for Biology. Between 2002 and 2005, lower division enrollments increased from 2,980 to 3,036 while upper level enrollments have increased from 589 to 725. Table 4 breaks out the majors by level in Fall and Spring semesters from Fall 2001 through Spring 2006. While the numbers vary depending on the undergraduate level and concentration, at the Senior level Biology majors, the Fall semester numbers have increased from 68 to 93 while the Spring semester numbers have increased from 69 to 101. Table 5 gives the headcount data paired with credit hours for academic year 2006.

Other Considerations: The biology program also services the needs of several other degree programs at Mesa State College. Programs that require their students to take our classes include: Nursing, Environmental Sciences, Physics, Human Performance and Wellness, X-ray

Technology, Chemistry, Secondary Education Licensure, Radiologic Technology, Early Childhood Education, and Office Supervision and Management: Medical Secretary. In addition many Mesa State College students take our General Biology courses for their natural sciences general education requirements.

Needs of the community are met in a number of ways. The community has benefited from the availability of student interns, student volunteers, graduates, faculty consultants, faculty guest lecturers/speakers, faculty for service roles (i.e. Science Fair) and science facility use (electron microscope facility, herbarium, darkroom etc.). In general the biology program is an important educational and service resource for the community. The vast majority of this interaction is conducted at no cost to the community organization or member. Interns are generally unpaid and the faculty does not charge for guest lectures or consulting.

D. NARRATIVE SUMMARY OF RESOURCES

The biology program has a number of characteristics and functions that collectively provide a means to meet these above goals. The effectiveness of the program is dependent on a variety of factors, however the major criteria that dictates the success of the program are 1) the quality of students 2) the quality of the faculty and 3) the quality of the curriculum and 4) the available resource base, including library resources.

1) Students

Mesa State College is designated as a moderately selective institution that admits diverse students with an array of talents and interests. Most of the freshman are recruited from the Western Slope of Colorado. We are also seeing a greater number of students from the Denver

area and Front Range. Mesa is also increasing its recruiting effort for out-of-state and foreign students.

The department also attempts to track as many of its graduates as possible. Departmental records exist for many biology majors who have graduated since 1976. Over the last 5 years, biology graduates have enrolled in, or have completed, graduate programs in biology or health related fields. These career fields include physicians, dentists, veterinarians, Ph.D. and M.S. scientists/ educators, physician assistants, physical therapists, chiropractors, optometrists, medical technologists, research technicians and field biologists. In addition, many recent graduates are presently employed as K-12 teachers in Grand Junction and throughout Colorado.

Finally, past biology students have received awards and scholarships for their academic and research achievements. These include the Sigma Xi Outstanding Student awards given by the Mesa State Chapter of Sigma Xi (a national scientific research society) and recognition awards by the Beta Beta Beta Biological National Honor Society for outstanding accomplishments in student research. In addition, current and former biology students have been awarded academic or athletic scholarships.

2) Faculty

The size of the biology faculty has remained close to the numbers at the time of the last program review, although some faculty have left and new faculty have joined. There are 12 tenured/tenure track faculty, 3 full time instructors (increased from 2 in the previous review), and several adjunct faculty. The biology faculty presently consists of 10 full professors, and two assistant professors, along with the three full time temporary instructors. All tenured or tenure track faculty have terminal degrees (Ph.D.-11 and D.V.M-1), as do 2 of our three instructors.

Table 7 lists the Biology department workload for 2005-2006. The bulk of our student credit hours are taught by tenured or tenure track faculty (5,604 compared to 1,745 for our full time instructors).

The department's educational offerings are broad due to the scientific diversity and disparate composition of its faculty (see vitae in Appendix 2). Our faculty specializations are as follows:

Tenured/tenure-track

Richard Ballard, Ph.D., Professor: Plant physiology, mycology, plant anatomy

Bruce Bauerle, D.A., Professor: Ecology, natural history, aquatic biology

Phyllis Chowdry, D.A., Professor: Pathophysiology, anatomy and physiology

Forbes Davidson, Ph.D. Assistant Professor: Cell biology, endocrinology

Kristy Duran, Ph.D. Professor: Botany, systematics

Gary McCallister D. A., Professor: Parasitology, Science teaching

Denise McKenney, Ph.D. Associate Professor: Microbial ecology, genetics

Carrie McVean-Waring, D.V.M., Assistant Professor: Anatomy and physiology

Kyle McQuade, Ph.D. Assistant Professor: Cell-molecular biology

Aparna Palmer, Ph.D. Assistant Professor: Invertebrate zoology, systematics

Tom Walla, Ph.D. Assistant Professor: Tropical ecology, statistics

Steven Werman, Ph.D. Professor: Molecular genetics, herpetology, embryology

Full time instructor

Richard Dujay, Ph.D.: Electron microscope facility manager, zoology

Stephanie Matlock-Cooley, M.A.: Anatomy and physiology, wildlife biology

Margot Beckett, Ph.D: Plant pathology, botany

Adjunct faculty

Eric Rechel, Ph.D.: Plant ecology

Carol Chapola, M.A.: Nutrition

Adam Gwiazdowski, D.C. : Anatomy and physiology

Mitchell Burke, M.A.: Anatomy and physiology

Jonathan Cooley, M.A.: Ecology

3) Curriculum

Students can presently choose from three degree programs in biology. The B.S. in Biological Sciences, the B.S. in Biological Sciences with Teacher Licensure and the A.S. in Biology. In addition, students choosing other majors can pursue a minor in Biology. The curriculum for each degree varies, but the important goal among the degree programs is to provide a broad base of educational experiences for the students.

B.S., Biological Sciences

The curriculum for this degree consists of four parts, 1) general education, 2) required biology core, 3) required related study area and 4) additional biology courses. In addition to these requirements 22 –24 hours of unrestricted electives are allowed. The minimum number of credit hours required for the B.S. in Biology is 120. The general education component to the degree does not have to be addressed in detail but consists of 33 credit hours of general education courses plus 6 credit hours of mathematics and/or statistics-computer science, for the B.S. degree distinction and 3 hours of human performance and wellness.

The required biology core is designed to give the students a broad yet fundamental background in biology without great specialization. The required courses include:

BIOL 105/105L Attributes of Living Systems

BIOL 106/106L Principles of Animal Biology

BIOL 107/107L Principles of Plant Biology

BIOL 310/301L Principles of Genetics

BIOL 483 Senior Thesis - or -

BIOL 482 Senior Research & BIOL 487 Independent Research

Students can choose either the thesis option or a research option for their terminal requirements. The thesis provides the student with an in-depth understanding and knowledge of a concept area in biology (e.g. reproduction, communication, energetics etc.), whereas the research option allows students to pursue research experiences useful for entry in to M.S. and Ph.D. programs following graduation.

The related study area is designed to provide the necessary background in chemistry and physics. Students are required to complete two semesters of general chemistry and one semester of general physics for a total of 15 credit hours. Laboratories are required for chemistry, whereas higher level physics courses without laboratories are allowed for the physics requirement.

Students must also choose 20 credit hours of additional biology to fulfill their requirements. Of these, 50% must be upper division (300-400 level) and their selection must include three of the four biology subcategories: a) Cell, Developmental and Molecular, b) Organismal, c) Anatomical and Physiological and d) Ecology, Evolution and Systematics. These additional biology courses are usually chosen in consultation with the faculty advisor based on the student's future goals.

B.S., Biological Sciences with Teacher Licensure

The curriculum for the concentration of teacher licensure has changed significantly since the last review. The program now requires a full year of chemistry, physics and geology. The

biology component has been reduced to three courses, BIOL105, BIOL 106, and BIOL107 plus 10 upper level biology credits. Licensure in science, rather than biology, requires more course work in all the science disciplines. One of our biology faculty also teaches BIOL 386 Introduction to Science Education.

A.S., Biology

The available associate degree program requires a total of 62 credit hours of instruction. Similar with other degree programs, 35 hours of general education is necessary but only 4 credit hours of mathematics (College Algebra or higher) is needed. The required biology core includes BIOL 105/105L, BIOL 106/106L and BIOL 107/107L (see above) with a minimum grade of “C” in each if the student wishes to transfer these courses to another institution. Beyond these courses, the student must choose 12 additional credit hours in biology, to be selected in consultation with the student’s advisor. The Associates degree program in biology, in the last decade, has been in very low demand and only a few students have been awarded this degree. Consequently, the program is presently under consideration for elimination.

Minor, Biology

For a student to minor in biology 20 –24 credit hours are required that must include BIOL 105/105L and BIOL 106/106L or BIOL 107/107L (see above). Of the remaining biology electives seven upper division (300-400) credit hours of instruction must be completed. The student must achieve a minimum GPA of 2.0 in the minor.

Diversity of Coursework within the Major

The department of biology offers a total of 55 different courses. Thirty-six of the total number of courses have laboratory components that require either a two hour lab once or twice per week or a three hour lab once per week. Of the total 50 are type “A” courses and 5 are type

“B”. Type “A” are traditional courses with designated times and places of instruction. Type “B” courses are those with flexible hours and meeting times (e.g. Internships, Independent Study, etc.).

Some of our most important course offerings, especially for our upper division biology majors, are courses that cover specialized topics not included in the standard curriculum. These “Special Topics” courses and in some cases “Seminar” courses have been extremely popular and have generated large student interest. Many of these courses have been developed and implemented based on both student requests and as a means to help faculty improve their knowledge in contemporary and fast paced fields. Also, based on course popularity and need, several have been elevated to permanent course status. The following is a partial list of Special Topics/Seminar courses that have been offered over the past five years: Biotechnology, Bioethics, Wine Fermentation, Ecology of the Pacific Northwest (taught in Oregon) and Biology of Cancer.

Research Coursework

A major shift in the biology program since the last program review has been to increase and improve the availability of research opportunities to students. These opportunities are sensitive to levels of financial resources, faculty interest and workload, facilities and equipment/reagent requirements. In the early nineties only 2 or 3 students per semester, at most, were conducting research activities with faculty members. Presently we are seeing 10-15 students per semester who are actively engaged in research. Faculty members with ongoing projects presently mentor 2 to 10 students each semester. The topics of this research vary and presently include areas of immunology, virology, parasitology, whirling disease, molecular systematics, molecular genetics, cell biology, fermentation, tropical ecology, electron

microscopy, microbiology and several others. Faculty only get a 1-3 hour reduction in their teaching load if they have more than 3 students signed up for 3 credit hours each. Even then, the load reduction only occurs if course needs can be met.

4) Resource base:

Library Resources (Note: Data found in Appendix 3)

The library assessment reflects our four main career options for graduates of our program: Wildlife/Ecology, Pre-Medical Professional (medical school, dental school, etc.), Research careers (graduate school) and teacher education. The library holdings are satisfactory for all of these areas, although all also need newer titles. This is a common problem as budget cuts reduce the ability of libraries to acquire current materials. The department has a library specific budget that currently is allocated in a somewhat haphazard manner. Only a few of the faculty actively add to the library holdings, and of course, the books ordered reflect their particular interest area. A future plan will address a more systematic method to insure appropriate acquisition of new material covering all of our emphasis areas.

Physical Resources

As mentioned in previous sections, our laboratory space and supplies budget is adequate for our current needs. However, increasing enrollments will lead to increased needs in the future. Also, we only have one “smart” laboratory which limits our ability to use computers and AV equipment effectively in labs.

E. EFFECTIVENESS

Accreditations: Mesa State College is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools (HLC). The Teacher Education program is

provisionally accredited by the National Council for Accreditation of Teacher Education (NCATE).

Changes since the last program review: There have been several changes in our program since the last review. Several courses have been added to our curriculum:

BIOL 154/154L Technobiology

BIOL 337/337L Criminalistics (required for the Forensics minor)

BIOL 344.344L Forensic Molecular Biology (also a choice for the Forensics minor)

BIOL 350/350L Microbiology

BIOL 386 Introduction to Science Education

BIOL 407 Tropical Field Biology: offered in Ecuador

BIOL 418/418L Wildlife Management

BIOL 426/426L Introduction to Electron Microscopy

Assessment of student academic achievements: The Biology department uses several tools to assess the program. All students are required to take the Biology MFT. In addition, students in Teacher Licensure are required to take the PRAXIS exam prior to student teaching. We also ask students to fill out an exit survey to assess. The survey is designed to identify the satisfaction level of our graduating seniors with such factors as the quality of their education, quality of laboratory skills and accessibility of faculty. A copy of our exit survey has been included in Appendix 4. The current survey is under modification to better assess the goals of our graduates. A copy of the proposed web-based survey is also included in Appendix 4. Institutional research

is also working with us to develop an employer/graduate school/professional school survey to better assess our student's performance after leaving Mesa State.

The latest MFT scores for 25 students in Fall 2005 and Spring 2006 show a mean score of 153. There are four subscore means: cell biology, 51; molecular biology and genetics, 51; organismal biology, 54; and population biology, evolution, and ecology, 55. The MFT also includes 9 assessment indicators with mean percent correct: biochemistry and cell energetics, 36; cellular structure, organization, function, 56; molecular biology and molecular genetics, 44; diversity of organisms, 47; organismal-animals, 61; organismal-plants, 47; population genetics and evolution, 63; ecology, 55; and analytical skills, 55.

On the PRAXIS II General Science, 13 students completed the exam from 9/1/04 through 8/31/05. Students are required to obtain at least 152 in continue in the Teacher Education program. The performance range was 156-174, compared with the national range of 153-180. There were 5 test categories with average percent correct: scientific methodology, techniques and history, 73, physical sciences, 63; life sciences 62; earth sciences 70; and science, technology and society, 72.

Based on the MFT assessment indicators, the program strengths are in cellular structure, animal biology, population genetics, ecology and analytical skills. The program may need more focus on biochemistry and molecular biology. For the Biology concentration majors, our chemistry requirement was increased from CHEM 121/122 to CHEM 131/132 in an attempt to address the biochemistry deficiency, but the change in chemistry requirements alone are apparently not sufficient. Based on the latest PRAXIS exams, the changes made to the Teacher Licensure concentration have successfully increased our pass rate to 100%. No further changes to the teacher licensure program are planned for the near future.

Faculty success data: The faculty success data is organized into 4 subheadings: teaching, advising, scholarship and service.

1) Teaching: The department offers courses in many areas, including molecular biology, ecology, evolution, and the health sciences. Faculty members normally teach 10-12 credit hours per semester depending on laboratory load.

A biology faculty member has received the annual Distinguished Faculty Award (2002), awarded to the outstanding faculty member at Mesa State College each year. Another faculty member recently received the Outstanding Educator of the Year Award (2002) from the Grand Junction Chamber of Commerce Business Education Partnership.

Another faculty member produced a CD, "Fundamentals of Teaching", for which he won the Communicator Award in 2004- International Award for Digital Communication Media, Education Division.

2) Advising:

Student advising is a critical component to the success and timely completion of degree requirement. Students are routinely assigned to a particular faculty member and are strongly encouraged to seek advising on the course of their undergraduate career. Faculty advisors also ensure that biology graduation requirements have been met at the time the student petitions for graduation and that students take appropriate coursework to meet their career goals and expectations. Presently, advisee loads for faculty range from 13 to 35 students per faculty with a mean of 22. In the past advisee loads have been as high as 50 students per faculty member and adjustments were made to even the distribution of advisees.

Biology professors support and advise three campus student organizations: 1) the Mesa chapter of the Biology National Honor Society (Beta Beta Beta), 2) the Mesa chapter of the national

American Medical Student Association and 3) the Mesa Student Health Advisory Club. The biology faculty are heavily involved in the organization and operation of the annual K-12 Western Slope Regional Science Fair.

3) Scholarship: The biology faculty is a group of accomplished scientists and scholars, as evidenced by scholarly publications and presentations at scientific meetings. One faculty member has recently published a textbook and several other faculty have been invited speakers at international symposia over the past few years. In addition, many faculty have ongoing research programs that include student participation. Current projects include investigations on tropical plant-animal interactions, pitviper biology, whirling disease, endangered cactus natural history, and the biology of disease vectors. Many members of the faculty continue to publish peer reviewed scientific papers that include undergraduate student authors. Current publications:

Tony Schountz, Renata green, Bennett Davenport, Amie Buniger, Tiffany jRichens, Jeffrey Root, Forbes Davidson, Charles Calisher and Barry Beaty (2004) "Cloning and characterization of deer mouse (*Peromyscus maniculatus*) cytokine and chemokine cDNA;s" *BMC Immunology* 5:1

Dyer, L., and A.N.D. Plamer. Eds. 2004. Piper: A model genus for studies of chemistry, ecology, and evolution. Kluwer/Plenum Academic Press. New York.

Herbst. M., Prescott, J., Plamer, A.D.N., and Schountz, T. 2002. Sequence and expression analysis of deer mouse interferon-gamma, interleukin-10, tumor necrosis factor, and lymphotoxin-alpha. *Cytokine* 17 (4): 203-213.

Dujay, Richard, K.L. Kosanke, 2001 Forensic identification of pyrotechnic reaction residue particles. *Microscopy Today* 10-4.

Dujay, Richard, 2002. Introduction to Scanning Electron Microscopy. ISBN 5-58692-471-0. Erudition Books, North Chelmsford, MA.

DeVries, J.J. and T.R. Walla. 2001 Long-term spatial and temporal species diversity in a neotropical fruit-feeding nymphalid butterfly community. *Biol. J.Lin. Soc.* 74: 1-15.

Walla, T. R., Engen S., DeVries, P.J., Lande,R. 2004. Modeling Vertical Beta Diversity in Tropical Butterfly Communities. *Oikos*.

Werman, S.D. 2007. Rattlesnake phylogeny and the evolution of neurotoxic phospholipases in rattlesnake venoms. *In: The biology of the rattlesnakes*. Hayes, W., et al., eds. Loma Linda University Press, Calif. (in press).

McCallister, G.L. 2005. DNA as binary code. *Journal of College Science Teaching* 34(5): 34-37.

Bruckart, III, W.L., Eskandary, F.M., Beckett, M.C., Bean, D. (2006) *Puccinia acroptili* on Russian knapweed in Colorado, Montana, and Wyoming. *Plant Dis.* 90:971.

The biology program encourages effort keeping its faculty current in their fields. Faculty members are provided travel funds to attend educational workshops, undergraduate research meetings, present research results at professional meetings, and to collaborate with faculty at other institutions. These activities directly enhance course offerings and student learning.

4) Service: The faculty also has significant service obligations to students, campus and the community. The biology faculty serve on a variety of departmental, campus and community committees, including travel committee, equipment committee, curriculum committee, faculty senate, search committees, science fair, animal care committee and the Grand Ricer Mosquito Control District. Faculty are also members of a variety of professional organizations including

the American Society for Microbiology, Sigma Xi, American Society of Parasitologists, American Biology Teachers and the American Horticultural Society.

Student success data:

1) Internship experiences: Students are encouraged to pursue internships at the end of their academic careers to help them obtain experience valuable in guiding their career goals.

Internships are used as upper division electives for graduation. A maximum of 12 internship hours may be accepted for upper level credit.

Students have been placed into internships based on their specific career goals, their desire to explore potential employment opportunities after graduation and the availability of internship positions in the community. Either students or faculty seek out internship possibilities or community agencies and businesses contact our department looking for potential internship candidates. In the past several years the diversity of internships has varied dramatically. Below is a partial list of community sponsors for nearly 40 of our most recent interns:

Amigo Animal Clinic

Federal Bureau of Land Management

Community Hospital

Colorado Bird Observatory

Colorado Bureau of Investigation

Colorado State University Fruita Research Center

Delores Canyon Research Center

Division of Wildlife

Enviro-Chem Analytical, Inc.

Harris Veterinary Clinic

Kokopelli Health and Fitness

Marillac Clinic

Mesa County Health Department

Municipal Water Treatment Facility, Grand Junction

Redlands Mosquito Control District

Saccomanno Cancer Research Institute

St. Mary's Hospital

U.S. Forest Service

Ute Water Conservancy District

Veterans Affairs Medical Center

2) Graduates of the program: Informal tracking of our graduates indicate great success entering graduate or professional schools, and in finding careers. Our graduates go on to medical school or have graduated from medical school, have entered or have graduated from graduate programs, and have careers physicians, physician assistants, research technicians, wildlife specialists and science teachers.

F. PROGRAM STRENGTHS

There are many strengths to the Biology program. The diversity of expertise among our faculty and the enthusiasm at which they conduct their professional roles is extremely important. Factors contributing to our strength include 1) an increase in the quality of students entering our program , 2) the increase in facility improvements and laboratory funding levels, 3) the addition of outstanding new faculty members and 4) the ability to recently improve our instructional capabilities and offer new courses.

Students appear to respond positively to the available course diversity, the small class sizes (average of 16 in upper division courses), the availability of their professors and the growth of the program in general. The biology student class has achieved a certain critical mass where students seem to associate themselves with a well-connected group and do not feel as isolated as students from smaller programs. Students also feel fortunate that they can often take multiple courses from the same instructor, thus cementing a genuine and knowledgeable association between the two. This allows for students to learn more from individual faculty members due to familiarity and it allows the faculty comprehensively become aware of the student's successes. The latter is used to better promote the student through professional faculty contacts, potential employers and to write detailed and substantive letters of recommendation.

The science facilities, research opportunities and laboratory exercises are definitely strong components of the biology program. There are few programs in the state that support undergraduate research as the biology program at Mesa State College. Most undergraduate students at other (and larger) institutions involved in research usually have their research indoctrination as glassware washers and lab assistants. Students involved in research in our program are gaining the same research experiences as the faculty. This provides a tremendous learning opportunity for students in our program.

The Western Colorado Center for Tropical Research (WCCTR) has had a significant impact on the education of our students and the reputation of our program outside of the Western Slope. Students at Mesa State College have unique experiences available to them for top level research in Ecuador as a result of the center's activities. Many experts in tropical ecology know of Mesa State College as a direct consequence of the center. Students have been granted

admission to M.S. and Ph.D. programs, and have been employed as direct result of previous work through the center. In addition, the center is advertised on the web.

The progression and expansion of the biology program in recent years is continuing with the addition of courses and students. Two new courses have been added to support a minor in Forensics, which appears to be a popular minor for our biology majors. In addition to traditional courses, students have many opportunities to gain experience through internships, independent study and research. We also provide opportunities for study in Ecuador and have offered courses on the Pacific Northwest ecology in Oregon. Students enter a variety of professional schools and embark on a variety of careers after graduation from the Biology Program.

G. PROGRAM WEAKNESSES

The biology program, in general, has few weaknesses. There are however several areas of concern that the faculty has either continued to address or are new concerns resulting from recent program growth. These concerns include freshmen retention rates, proper early advising of students, and the future costs of equipment, including faculty and student computer resources. Also, the MFT exam shows something of a deficiency in the biochemistry area. Our curriculum does not require biochemistry beyond the introductory BIOL 105. The department will be considering strengthening our program in this area

Nearly one-half of our freshmen biology majors do not remain in the program after their first year. This can be due to a combination of factors including, lack of adequate high school preparation, changing of majors, transfer to other institutions, financial issues, or loss of interest after their freshman sequence in biology. It is not clear what factor or factors are the major contributors to freshmen loss, but this remains as an ongoing problem. Our BIOL 105 Attributes of Life, the introductory course for our majors, has a relatively high failure rate (36%, and has

been listed as a “high risk” course by the institution. The course itself is quite challenging, and high failure rate is somewhat expected. However, in the last 5 years, we had changed the way the course was taught. Until five years ago, we offered two sections every semester with a maximum enrollment of 40 in each section. Five years ago, we began only offering a single section which could have 80+ students. Beginning Fall 06, the department is address this weakness by returning to multiple section offerings. It is hoped that, with a smaller class, struggling students can be more readily identified and helped, thereby reducing the failure rate.

Presently, the biology program is well equipped with laboratory apparatuses and microscopes (24 microscopes were replaced last year) to address the needs of the existing courses and students. However, our laboratories need more computing capability to allow data from the class to gather more efficiently, as well as to allow access to more visually oriented material.

H. VISION

We need to increase student retention and graduation rates. We have addressed one factor by decreasing the size of our introductory course, BIOL 105. The institution has also taken steps to better identify struggling freshman, and offer help early. It’s too soon to tell if those efforts will be effective. We would like to track our graduates more formally, and are working with Institutional Research to implement an employer survey as well as a graduate school/professional school survey in order to better assess the success of our program in meeting the needs of our graduates.

We are also looking to expand the biology library resources, in a more systematic, program-building manner.

Our vision is to build on our success by increasing research opportunities and course offerings to better prepare our students. We also have a goal of increasing the enrollment in the Teacher Licensure program. We have taken steps in that direction by first assessing the needs in the public school. One of our faculty members surveyed the needs within District 51 to determine if our program was adequate. He discovered a huge communication problem between Mesa State and the district. A copy of his report has been included in Appendix 5. We would like to improve communication within the district so that our Biology Program can better meet the needs of future students.

Appendix 1: Program Statistics



Table 1. UNDUPLICATED DEGREE EMPHASIS, AY 2002 - 2006

BIOLOGICAL SCIENCES		2001-2002				2002-2003				2003-2004							
Degc	EmphCd	Description	Majr1	Majr2	Majr3	Majr4	TOTAL	Majr1	Majr2	Majr3	Majr4	TOTAL	Majr1	Majr2	Majr3	Majr4	TOTAL
BS	3410	Biological Sciences-Biology	242	0	20	0	262	250	0	27	0	277	284	1	30	0	315
BS	3412	Biology, Teacher Certification	22	1	2	0	25	23	1	2	0	26	22	1	3	0	26
BIOLOGICAL SCIENCES TOTAL			264	1	22	0	287	273	1	29	0	303	306	2	33	0	341

BIOLOGICAL SCIENCES		2004-2005				2005-2006						
Degc	EmphCd	Description	Majr1	Majr2	Majr3	Majr4	TOTAL	Majr1	Majr2	Majr3	Majr4	TOTAL
BS	3410	Biological Sciences-Biology	297	0	23	0	320	298	0	22	0	320
BS	3412	Biology, Teacher Certification	23	0	5	0	28	23	0	5	0	28
BIOLOGICAL SCIENCES TOTAL			320	0	28	0	348	321	0	27	0	348

Table 2. UNDERGRADUATE BIOLOGY SCIENCE ENROLLMENT BY MAJOR CODES, Fall Terms 2001 - 2005
Mesa State College

Level	Major Code	Program Name	2001	2002	2003	2004	2005
Baccalaureate	3410	Biological Science - Biology New Majors	78	87	95	97	95
		Continuing Majors	139	125	131	153	161
	Sub-Total		217	212	226	250	256
	3412	Biology, Teacher Certification New Majors	10	7	4	5	6
		Continuing Majors	17	14	14	11	12
	Sub-Total		27	21	18	16	18
Grand Total		All Biology	88	94	99	102	101
		New Majors	156	139	145	164	173
		Continuing Majors	244	233	244	266	274

Table 3. PROGRAM SUMMARY: BIOLOGICAL SCIENCES
Mesa State College

Program	Year	Enrollments											FTES:			
		AY Majors		FY Registration			FY Credit Hours				AY Faculty FTE			Total	FTEF	
		1 st	Total	Lower Div	Upper Div	Total	Remedial	Lower Div	Upper Div	Total	T/TT	FT Temp	Other*			
Biology	2002-03	332	371	2,980	589	3,569	0	7,078	1,337	8,415	281	13.46	2.29	1.63	17.38	16.14
	2003-04	346	394	2,982	634	3,616	0	7,110	1,427	8,537	285	12.46	2.63	1.71	16.80	16.94
	2004-05	392	447	3,273	739	4,012	0	7,241	1,660	8,901	297	14.50	2.08	2.09	18.67	15.89
	2005-06	388	436	3,036	725	3,761	0	6,798	1,649	8,447	282	10.04	3.13	3.79	16.96	16.60

Note: Based on state-funded; includes summer; excludes Montrose and cash-funded hours
(e.g. Extended Campus Program, Early Scholars Program)

*Other includes part-time and administrator instruction

Table 4. UNDERGRADUATE BIOLOGY ENROLLMENTS

Fall Terms 2001-2005

Level	Major Code	Program Name					
			2001	2002	2003	2004	2005
Freshman	3410	Biological Sciences - Biology Biology - Teacher Certification	67	71	82	80	70
TOTAL	3412		5	5	3	4	4
Sophomore	3410	Biological Sciences - Biology Biology - Teacher Certification	44	48	47	42	44
TOTAL	3412		5	3	5	1	3
Junior	3410	Biological Sciences - Biology Biology - Teacher Certification	38	41	41	52	49
TOTAL	3412		7	4	4	2	6
Senior	3410	Biological Sciences - Biology Biology - Teacher Certification	68	52	56	76	93
TOTAL	3412		10	9	6	9	5

Spring Terms 2002-2006

Level	Major Code	Program Name					
			2002	2003	2004	2005	2006
Freshman	3410	Biological Sciences - Biology Biology - Teacher Certification	56	51	50	51	57
TOTAL	3412		5	4	4	4	5
Sophomore	3410	Biological Sciences - Biology Biology - Teacher Certification	44	47	51	48	47
TOTAL	3412		4	3	5	3	4
Junior	3410	Biological Sciences - Biology Biology - Teacher Certification	35	46	41	55	46
TOTAL	3412		3	5	3	2	3
Senior	3410	Biological Sciences - Biology Biology - Teacher Certification	69	63	72	87	101
TOTAL	3412		13	5	10	10	5

Table 5. HEADCOUNT AND CREDIT HOUR DISTRIBUTION (AY 2006)

Level/Course Level	Summer Headcount	Summer Credit Hours	Fall Headcount	Fall Credit Hours
Undergraduate				
Remedial - 000	0	0.0%	0	0.0%
Lower - 100	0	0.0%	950	51.0%
Lower - 200	65	43.9%	588	31.5%
Upper - 300	1	0.7%	127	6.8%
Upper - 400	82	55.4%	199	10.7%
Subtotal Undergraduates	148	100.0%	1,864	100.0%
Graduate				
Graduate - 500	0	0.0%	0	0.0%
Subtotal Graduates	0	0.0%	0	0.0%
Total	148	100.0%	1,864	100.0%

Level/Course Level	Spring Headcount	Spring Credit Hours	Total Credit Hours
Undergraduate			
Remedial - 000	0	0.0%	0
Lower - 100	722	40.4%	3,755
Lower - 200	687	38.4%	3,096
Upper - 300	230	12.9%	790
Upper - 400	149	8.3%	1,014
Subtotal Undergraduates	1,788	100.0%	8,655
Graduate			
Graduate - 500	0	0.0%	0
Subtotal Graduates	0	0.0%	0
Total	1,788	100.0%	8,655

Table 6. BIOLOGY FACULTY BY TENURE STATUS, 2004-2006

	Biology	2003-2004 FTE		2004-2005 FTE		2005-2006 FTE	
		FTE	%	FTE	%	FTE	%
Status							
	Tenure	9.0	61.2%	11.0	73.3%	11.0	67.5%
	Tenure-track	3.0	20.4%	1.0	6.7%	0.0	0.0%
Total Tenure							
	FT Instructor	2.1	14.3%	2.4	16.0%	3.7	22.7%
	PT Instructor	0.6	4.1%	0.6	4.0%	1.6	9.8%
TOTAL		14.7	100.0%	15.0	100.0%	16.3	100.0%

Table 7. BIOLOGY DEPARTMENT WORKLOAD 2005 - 06 BY PROGRAM

INSTRUCTOR TYPE	PROGRAM	TRACK	COURSE		STUDENT		FTEF	FTEF	FTES/ FTEF
			CREDIT HOURS	HEADCOUNT ENROLLMENT	CREDIT HOURS	CREDIT HOURS			
1 - T/TT Total	BIOL Total	A Total	210.000	2,365	5,523.00				
		B Total	21.000	16	36.00				
3 - FT Temp Total	BIOL Total	A Total	231.000	2,381	5,559.00		9.63	185.30	19.25
		B Total	231.000	2,381	5,559.00		9.63	185.30	19.25
6 - PT Total	BIOL Total	A Total	69.000	880	1,739.00				
		B Total	6.000	1	6.00				
Grand Total	BIOL Total	A Total	75.000	881	1,745.00		3.13	58.17	18.61
		B Total	75.000	881	1,745.00		3.13	58.17	18.61
Grand Total	BIOL Total	A Total	39.000	440	953.00				
		B Total	39.000	440	953.00		1.63	31.77	19.55
Grand Total	BIOL Total	A Total	39.000	440	953.00		1.63	31.77	19.55
		B Total	345.000	3,702	8,257.00		14.38	275.23	19.15
Grand Total	BIOL Total	A Total	345.000	3,702	8,257.00		14.38	275.23	19.15
		B Total	345.000	3,702	8,257.00		14.38	275.23	19.15

MESA STATE COLLEGE
BIOLOGY

Table 8.

CAMPUS	DISCIPLINE	LEVEL	CHS	TOTAL FACULTY COMPENSATION	(A) TOTAL OTHER COMPENSATION	(B) OTHER CURRENT EXPENDITURES	(C) OTHER INSTRUCTION	(D) ACADEMIC SUPPORT	(C) STUDENT SERVICES	(E) INSTITUTIONAL SUPPORT	(C) PLANI	TOTAL COSTS	COSTS/ CREDIT HOUR
2004 Main	BIOL	LOWER	6,385 \$	597,525 \$	72,969 \$	98,312 \$		\$ 138,553	\$ 119,715	\$ 109,388	\$ 147,934	\$ 1,284,396	\$ 201
2004 Main	BIOL	UPPER	1,311	265,859	14,983	20,186		28,448	24,580	22,460	30,375	406,891	310
2004	BIOL	TOTAL	7,696 \$	863,384 \$	87,952 \$	118,498 \$	-	\$ 167,001	\$ 144,295	\$ 131,848	\$ 178,309	\$ 1,691,287	\$ 220
2005 Main	BIOL	LOWER	6,346 \$	481,188 \$	54,805 \$	60,383 \$	22,495 \$	\$ 119,827	\$ 116,786	\$ 90,408	\$ 131,416	\$ 1,057,308	\$ 167
2005 Main	BIOL	UPPER	1,512	412,110	13,058	14,387	5,360	28,550	27,825	21,541	31,311	554,142	366
2005	BIOL	TOTAL	7,858 \$	873,298 \$	67,863 \$	74,770 \$	27,855 \$	\$ 148,377	\$ 144,611	\$ 111,949	\$ 162,727	\$ 1,611,450	\$ 205

(A) Includes department head stipends and support staff.
(B) Includes course fees and travel.

(C) Allocated by % of total credit hours.

(D) Allocated by % of total Faculty FTE.

(E) Includes institutional scholarships.

Table 9.

Comparative Budget Report FY06-07

First Quarter

BIOLOGICAL SCIENCES

POOL ACCT CODE	FY06 Annual		FY07 Annual	1Qtr FY06		1Qtr FY07	% FY06	% FY07	Variance
	Budget	Budget	Budget	Actual	Actual	Budget	Budget		
50000	SUPPORT STAFF SALARY AND WAGES								
5006	\$72,293.00	\$74,037.00	\$0.00	\$0.00	\$6,587.67	0.00%	8.90%	\$6,587.67	
5026	\$0.00	\$0.00	\$19,016.66	\$11,842.68	\$11,842.68	0.00%	0.00%	(\$7,173.98)	
5116	\$0.00	\$0.00	\$484.72	\$1,540.51	\$1,540.51	0.00%	0.00%	\$1,055.79	
5126	\$0.00	\$0.00	\$259.62	\$528.14	\$528.14	0.00%	0.00%	\$268.52	
	Pool Subtotal:								
	\$72,293.00	\$74,037.00	\$19,761.00	\$20,499.00	\$20,499.00	27.33%	27.69%	\$738.00	
51460	SUPPORT STAFF BENEFITS								
5146	\$0.00	\$0.00	\$282.99	\$296.36	\$296.36	0.00%	0.00%	\$13.37	
5166	\$7,518.00	\$8,070.00	\$2,001.15	\$2,176.71	\$2,176.71	26.62%	26.97%	\$175.56	
5206	\$0.00	\$0.00	\$114.06	\$208.08	\$208.08	0.00%	0.00%	\$94.02	
5216	\$8,895.00	\$9,032.00	\$1,951.41	\$1,702.26	\$1,702.26	21.94%	18.85%	(\$249.15)	
5226	\$0.00	\$0.00	\$28.08	\$48.24	\$48.24	0.00%	0.00%	\$20.16	
5236	\$0.00	\$0.00	\$29.07	\$30.12	\$30.12	0.00%	0.00%	\$1.05	
	Pool Subtotal:								
	\$16,413.00	\$17,102.00	\$4,406.76	\$4,461.77	\$4,461.77	26.85%	26.09%	\$55.01	
52560	CONTRACT REGULAR WAGES								
5256	\$651,719.00	\$670,541.00	\$103,241.34	\$111,756.96	\$111,756.96	15.84%	16.67%	\$8,515.62	

Thursday, October 12, 2006

BIOLOGICAL SCIENCES

ORG: 1410

POOL ACCT CODE	FY06 Annual		FY07 Annual		1Qtr FY06		1Qtr FY07		% FY06		% FY07		FY06-FY07 Variance
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	
Pool Subtotal:													
52860	\$651,719.00	\$103,241.34	\$670,541.00	\$111,756.96	\$15.84%	\$16.67%							\$8,515.62
CONTRACT PART TIME WAGES													
5286	\$103,164.00	\$21,747.33	\$110,385.00	\$22,071.19	21.08%	19.99%							\$323.86
5296	\$21,110.00	\$3,360.00	\$24,710.00	\$4,200.00	15.92%	17.00%							\$840.00
Pool Subtotal:													
54160	\$124,274.00	\$25,107.33	\$135,095.00	\$26,271.19	20.20%	19.45%							\$1,163.86
CONTRACT BENEFITS													
5416	\$0.00	\$2,270.82	\$0.00	\$4,178.06	0.00%	0.00%							\$1,907.24
5426	\$0.00	\$1,484.64	\$0.00	\$1,477.29	0.00%	0.00%							(\$7.35)
5436	\$0.00	\$989.99	\$0.00	\$1,897.79	0.00%	0.00%							\$907.80
5446	\$0.00	\$1,059.54	\$0.00	\$1,319.13	0.00%	0.00%							\$259.59
5466	\$85,337.00	\$8,487.71	\$90,287.00	\$7,156.53	9.95%	7.93%							(\$1,331.18)
5506	\$0.00	\$1,228.86	\$0.00	\$1,696.25	0.00%	0.00%							\$467.39
5516	\$103,788.00	\$11,073.47	\$93,977.00	\$10,625.06	10.67%	11.31%							(\$448.41)
5526	\$0.00	\$918.39	\$0.00	\$548.82	0.00%	0.00%							(\$369.57)
5536	\$0.00	\$288.11	\$0.00	\$332.88	0.00%	0.00%							\$44.77
Pool Subtotal:													
56000	\$189,125.00	\$27,801.53	\$184,264.00	\$29,231.81	14.70%	15.86%							\$1,430.28
HOURLY COMPENSATION													
5606	\$0.00	\$25.56	\$0.00	\$0.00	0.00%	0.00%							(\$25.56)

BIOLOGICAL SCIENCES

ORG: 1410

POOL ACCT CODE	FY06 Annual		FY07 Annual		1Qtr FY06		1Qtr FY07		% FY06		% FY07		FY06-FY07 Variance
	Budget		Budget		Actual		Actual		Budget		Budget		
5706 STUDENT ASSISTANTS	\$1,500.00		\$1,500.00		\$260.00		\$0.00		17.33%		0.00%		(\$260.00)
5816 STUDENT MEDICARE CONTRIBUTIO	\$0.00		\$0.00		\$3.77		\$0.00		0.00%		0.00%		(\$3.77)
Pool Subtotal:		\$1,500.00	\$1,500.00	\$289.33	\$0.00	\$0.00	19.29%	0.00%	0.00%				(\$289.33)
61000 OTHER CURRENT EXPENSE													
6201 SUPPLIES	\$20,681.00		\$20,681.00		\$638.86		\$404.87		3.09%		1.96%		(\$233.99)
6211 SOFTWARE	\$0.00		\$0.00		\$218.00		\$0.00		0.00%		0.00%		(\$218.00)
6230 PRINTING OFF-CAMPUS	\$0.00		\$0.00		\$52.50		\$0.00		0.00%		0.00%		(\$52.50)
6310 SUBSCRIPTIONS & BOOKS	\$0.00		\$0.00		\$71.42		\$108.09		0.00%		0.00%		\$36.67
6430 POSTAGE	\$250.00		\$250.00		\$35.40		\$32.36		14.16%		12.94%		(\$3.04)
6450 FREIGHT IN	\$0.00		\$0.00		\$0.00		\$38.50		0.00%		0.00%		\$38.50
6501 EQUIPMENT REPAIR & MAINTENAN	\$500.00		\$500.00		\$185.00		\$0.00		37.00%		0.00%		(\$185.00)
6760 RENT/LEASE EQUIPMENT	\$0.00		\$0.00		\$1,017.09		\$70.11		0.00%		0.00%		(\$946.98)
6850 OFFICIAL FUNCTIONS	\$0.00		\$0.00		\$0.00		\$75.00		0.00%		0.00%		\$75.00
7150 PROFESSIONAL DEVELOPMENT	\$0.00		\$0.00		\$0.00		(\$457.50)		0.00%		0.00%		(\$457.50)
8100 EQUIPMENT NON-CAPITAL	\$0.00		\$0.00		\$178.00		\$0.00		0.00%		0.00%		(\$178.00)
8101 COMPUTER EQUIPMENT NON-CAPIT	\$0.00		\$0.00		\$0.00		\$57.09		0.00%		0.00%		\$57.09
Pool Subtotal:		\$21,431.00	\$21,431.00	\$2,396.27	\$328.52	11.18%	1.53%						(\$2,067.75)
61500 TRAVEL													
6150 EMPLOYEE TRAVEL - IN STATE	\$7,200.00		\$7,200.00		\$0.00		\$0.00		0.00%		0.00%		\$0.00

Thursday, October 12, 2006

BIOLOGICAL SCIENCES

ORG: 1410

POOL ACCT CODE	FY06 Annual		FY07 Annual		1Qtr FY06		1Qtr FY07		% FY06		% FY07		FY06-FY07 Variance
	Budget		Budget		Actual	Budget	Actual	Budget	Budget	Budget	Budget		
6170 EMPLOYEE TRAVEL - INTERNATION	\$0.00		\$0.00		\$0.00	\$0.00	\$2,722.00		0.00%	0.00%	0.00%		\$2,722.00
Pool Subtotal:	\$7,200.00		\$7,200.00		\$0.00	\$0.00	\$2,722.00		0.00%	0.00%	37.81%		\$2,722.00
64010 INTERNAL CHARGES													
6401 TELEPHONE CALLS	\$500.00		\$500.00		\$37.99		\$190.90		7.60%		38.18%		\$152.91
6410 TELEPHONE EQUIPMENT	\$10,032.00		\$10,032.00		\$1,650.00		\$1,782.00		16.45%		17.76%		\$132.00
Pool Subtotal:	\$10,532.00		\$10,532.00		\$1,687.99		\$1,972.90		16.03%		18.73%		\$284.91
88850 OTHER CURRENT EXPENSE													
8885 BUDGETED CHANGE TO FUND BALA	\$12,763.00		\$14,699.00		\$0.00		\$0.00		0.00%		0.00%		\$0.00
Pool Subtotal:	\$12,763.00		\$14,699.00		\$0.00		\$0.00		0.00%		0.00%		\$0.00
Expense Pool Totals:	\$1,107,250.00		\$1,136,401.00		\$184,691.55		\$197,244.15		16.68%		17.36%		\$12,552.60
Total Revenue:	\$0.00		\$0.00		\$0.00		\$0.00						
Total Expenditures:	\$1,107,250.00		\$1,136,401.00		\$184,691.55		\$197,244.15						
Net:	\$1,107,250.00		(\$1,136,401.00)		(\$184,691.55)		(\$197,244.15)						

Appendix 2: Faculty Vitae



Stephanie Jo Matlock-Cooley

1419 Rood Avenue
Grand Junction, Colorado 81501
(970) 270-3004
Email: dear_mice@yahoo.com

ACADEMIC BACKGROUND

Montana State University: Bozeman, Montana

- M.S. in Biological Sciences.
Thesis: Interaction Between Deermice, Cattle, and Antelope
Bitterbrush in Southwestern Montana
- Matriculated December 1993.

University of Colorado: Boulder, Colorado

- B.A. Biology and B.A. Anthropology
- Matriculated August 1988.

PROFESSIONAL EXPERIENCE

Mesa State College: Grand Junction, Colorado Aug 1995 - Present

Lecturer in Biology

- ❖ Developed, prepared, and instructed courses in the Biology Department including:
 - Lower division courses in: Introductory Biology lectures and laboratories for Biology majors (105) and non-majors (101). Introductory Human Anatomy and Physiology lecture and labs(141).
 - Upper Division courses in: Wildlife Management Lecture(418), Wildlife Field Techniques(418), Ichthyology Lecture(396), and Desert Ecology (496).

EDx,L.L.C.(Educational Expeditions): Fruita, Colorado June 2000-Present

Lecturer/Guide

- ❖ Summer Field Expedition Tour programs specializing in Dinosaur excavation and ecology, and desert ecology:
 - Handle tour groups from National Geographic, American Museum of Natural History, Smithsonian, and other alumni groups throughout a summer session. Week long tours of 10-30 parents and children.
 - Teach local desert ecology, and animal ecology to children ages 6-16.

- Prepare meals and feed large groups daily. Organize logistics. Drive 15 passenger van daily.
- Raft Guide for raft carrying 10 passengers down the Colorado River.
- Problem solve for changes to itineraries, illnesses, injuries and other daily challenges.

U.S. Forest Service: Norwood and Delta Colorado. Jun 1994 - Sept. 94

Biological Technician

- ❖ Monitored 200 artificial nest boxes for use by boreal owls and other small owls such as northern sawwhet and flammulated owls.
- ❖ Surveyed 15 canyons on the Uncompahgre Plateau in southwestern Colorado for the endangered Mexican Spotted Owl. *Certified to survey for Mexican Spotted Owl.*
 - Hiked extensively at 600-9000 foot elevations.
 - Used topographic maps, compass, and PBS maps daily.
 - Utilized 4-Wheel Drive vehicles on very rough and isolated roads.
 - Worked and lived intensively with one other person.
 - Hours of work consisted of dusk to dawn shift, hiking at night in rough terrain with only headlamps.
 - Encountered black bears and mountain lions at close range.
 - Able to identify most western owls by vocalization.
- ❖ Assisted in MAPS project for mark/recapture study of neotropical migrants.
 - Trapped birds in mist nests, extricated birds, identified, banded, sexed, aged, noted plumage condition, and reproductive condition of all birds.
 - Recorded data during highly successful trapping periods for multiple people.

Intermountain Desert Consultants: Durango, Colorado. Dec. 1993-Mar. 1994

Personal Business Biological Consultant

- ❖ Designed research project to determine bald and golden eagle habitat on 1,000 acre ranch.
 - Surveyed ranch for raptors.
 - Monitored critical areas used by bald eagles.
 - Prepared report of results and recommendations.
 - Interacted extensively with client, several federal agency personnel, and the public.

Montana Department of Fish and Wildlife: Bozeman, Montana.

Sept. 1990-Feb. 1991

Block Manager/Check Station Attendant

- ❖ Responsible for a block management area encompassing both private and state-owned land during the fall hunting season. Interacted with both landowners and the hunting public. Patrolled block management area independently in a 4-wheel drive vehicle in all types of weather. Posted signs, distributed hunting regulations and information, and recorded hunting activity.
- ❖ Responsible for hunting check station during the regular and late hunting seasons. Extracted teeth for aging purposes and collected fetuses from harvested elk and deer. Weighed all harvested animals and recorded hunting information. Interacted with the public extensively.
- ❖ Assisted in a male mule deer mortality research project. Handled mule deer captured in drive nets, and assisted in tagging and radio-collaring animals.

The Peregrine Fund: Mackay, Idaho. July - Sept. 1990

Hack Site Attendant

- ❖ Cared for and maintained 6 immature Peregrine Falcons.
 - Observed falcons for 8 weeks until successful fledging occurred.
 - Observed and recorded each falcon's daily behavior from sunrise to sunset.
 - Lived at 9500 ft in primitive fire look-out tower with a partner.

Okeanos Ocean Research Foundation: Hampton Bays, New York. Oct. 1989 - Feb. 1990

Research Volunteer

- ❖ Conducted distributional data analysis of the finback whales residing off the coast of Long Island, New York. Accompanied Director to Iceland for International Whaling Commission Meetings.
- ❖ Handled sick and injured harbor and ringed seals.
- ❖ Assisted in removing oil from Murres and Gannets by washing birds in bucket system using Dawn dish washing detergent.

Lincoln Park Zoo: Chicago, Illinois. Apr. 1989 - June 1989

Animal Keeper Class II

- ❖ Cared for and maintained animals in the Children's Zoo.
 - Handled owls, hawks, iguanas, snakes, foxes, deer, African pygmy goats, and other small mammals.
 - Presented interpretive talks to inner-city children about zoo animals and their behavior.

University of Colorado-Biology Dept.: Boulder, Colorado. June - Aug. 1988

Research Assistant

- ❖ Collected data for the analysis of behavioral interactions among related and non-related domestic honeybees.
 - Participated in experiments to determine the ability of the honeybees to recognize kin through olfaction.
 - Designed own experiment and instrumentation, to determine the honeybee's ability to recognize specific organic compounds in their hives.

Colorado Division of Wildlife: Sept. 1986 - Jan. 1987 and July 1987

Research Volunteer/Intern

- ❖ Co-authored a document describing the essential habitat of threatened and endangered wildlife of Colorado.
- ❖ Assisted with a mountain goat survey research project on Mt. Evans, Colorado
 - Surveyed goats with spotting scopes for daily periods at 13,000 ft.

OTHER WORK EXPERIENCE

Western Colorado Regional Science Fair-Grand Junction, Colorado: March 2005-Present.

Director

- ❖ Arrange logistics for the Western Colorado Regional Science Fair for 397 students, grades 6-12.
 - Find and organize 199 judges for exhibits.
 - Organize special awards for students.
 - Prepare forms, communicate with multiple agencies, and orchestrate a hectic, high profile event.
 - Interview with various forms of media.

Linblad Expeditions-Lower and Upper Caribbean, Panama: Jan 1990, 1991, 1992, 1993, 1994, 1995, 2000.

Volunteer

- Helped prepare lectures on fruits and spices from St. Lucia.
- Helped with Birding Expeditions in Trinidad and Tobago.

U.S. Forest Service - Challis National Forest: July - Sept. 1990

Volunteer

- ❖ Maintained and repaired an historic fire look-out tower. Duties included: scraping and painting the structure, and repairing broken windows.
 - Inspected the surrounding area for forest fires.

Montana State University – Biology Dept.: Nov. 1993

Research Assistant

- ❖ Assisted fellow graduate student in research involving fish survival in irrigation ditches.
 - Electro-shocked 5 species of fish in ditches using portable shocking units.
 - Collected, weighed, measured, and identified all species of fish.
 - Recorded all pertinent data.

Institute of Alpine and Arctic Research: July 1988

Volunteer Field Assistant for Long Term Ecological Study (LTES)

- ❖ Assisted in the live trapping of rodents (marmots, voles, and deermice) and pikas using Sherman and Hav-a-hart traps.
 - Recorded data and tagged all captured animals.

TECHNICAL SKILLS AND CERTIFICATIONS

- Experienced with the use of radio telemetry equipment and techniques including:
 - construction of transmitters
 - utilization of receivers and hand held antennae.
- Experienced with use of Sherman Live traps, Hav-A-Hart traps, mist nets, and large game drive nets.
- Certified for Mexican Spotted Owl Inventory.
- Certified in Community CPR and Standard First Aid.
- Computer Skills:
 - Competent with the use of IBM compatible and Macintosh systems.
- Spanish – able to read and write proficiently, and understand and speak passably.

ACTIVITIES

- Traveled extensively through Europe, the United Kingdom, Iceland, Guatemala, Africa, Ecuador, Panama, and the Caribbean.
- Participated in the Rotary Club High School Exchange Program to Mexico.
- Enjoy photography, technical rock climbing, rafting, and volleyball.

REPORTS AND PUBLICATIONS

Douglass, Richard, Amy Kuenzi, and Stephanie Matlock-Cooley. 2006. Deer mouse movements in peridomestic and sylvan settings in relation to Sin Nombre virus antibody prevalence. *Journal of Wildlife Diseases*. 42: (4).

- Matlock-Cooley, S. J. and E. Holland.** 1994. 1994 Mexican spotted owl inventory Uncompahgre National Forest, Colorado. Unpublished field report on file at the Supervisor's Office of the Uncompahgre National Forest, Delta, Colorado.
- Matlock-Cooley, S. J.** 1993. Interaction between deermice, cattle and antelope bitterbrush. Unpublished Master's thesis on file at Montana State University, Bozeman, Montana, 84 pp.
- Matlock-Cooley, S. J. and L. Ness.** 1991. Field Report published in the Peregrine Fund 1991 Annual Report.
- Matlock, S. J.** 1987. Faunal remains from Holly Group, Hovenweep National Monument. Appendix D: in The Maintenance and Structural Stabilization of Holly Group (5MT602), Hackberry Group (5MT601), Hovenweep National Monument, Southeastern Utah-Southwestern Colorado. Nickens and Associate Ruins Stabilization Report. National Park Service Technical Series No. 19.
- Metzgar, T. R. and S. J. Matlock.** 1987. Summary for Previous Stabilization Records, Hovenweep National Monument, Southeastern Utah-southwestern Colorado, Square Tower Group, Holly Group, Horseshoe Group, and Hackberry Group 1940-1983. Nickens and Associates Ruins Stabilization Report. National Park Service Technical Series No. 37.
- Metzgar, T. R. and S. J. Matlock.** 1987. Stabilization Assessment of Square Tower Group: Sites in Hovenweep National Monument, Southeastern Utah-southwestern Colorado. Nickens and Associates Ruins Stabilization Report. National Park Service Technical Series No. 36.
- Matlock, S.** 1986. Faunal Analysis of EU38, Yellow Jacket, Colorado. Ms. on file, University of Colorado Museum, Boulder, Colorado.

VITA 2006
CARRIE MCVEAN WARING, DVM

Professor of Biology
Mesa State College
272 Wubben Hall
1100 North Ave
Grand Junction, CO 81501
(970) 248-1165
cmcvean@mesastate.edu

Education

DVM. Doctor of Veterinary Medicine

Colorado State University
Fort Collins, CO. 80523
Graduated: May 1988
State Licenses: Colorado, Oregon, Nevada.
Elective courses of study include: Laboratory animal medicine
Exotic animal medicine

Bachelor of Science, Major: Veterinary Science

Colorado State University
Fort Collins, CO. 80523
Graduated: May 1985
Field of study: Animal Sciences and Biochemistry

Teaching Experience

Current : Professor of Biology, MSC (F2006-present)

**Associate Professor of Biology, School of Natural Sciences & Math
MSC (F2001-2006)**

**Assistant Professor of Biology, School of Natural Sciences and Mathematics,
Mesa State College (F96-Sp 2001)**

**Instructor, School of Natural Sciences and Mathematics,
Mesa State College (F94-Sp96)**

**Instructor, Department of Agriculture,
Mesa State College (F93-Summer94)**

**Undergraduate Supervised College Teaching,
Colorado State University (Sp84)**

Courses Instructed

Biol 416, Co-taught Ethology

Course discussed the relationship between anatomical systems and behavior.

Biol 101, General Biology Lecture and Laboratory

Introductory Biology course required as a general education course for non-biology majors. Pertinent subject matter covered.

Biol 209/141 Human Anatomy and Physiology Lecture and Lab I

Introductory course which covers physiology of human organ systems. The laboratory teaches anatomy of human and cat organ systems.

Biol 210/145 Human Anatomy and Physiology Lecture and Lab II

Second semester course of A&P which covers material not previously covered in Biol 141.

Biol 250 Microbiology Laboratory

Practical laboratory course which explores bacterial properties, sterile techniques for microbiological handling and safety are stressed to prepare student for laboratory work.

Agri 225, Agriculture Business Records\Analysis

Basic record keeping, balance sheets, income statements, labor costs and financial analysis,

Agri 254, Livestock Feeding and Laboratory

Animal nutrition, digestive system physiology, feed analysis and how to balance a daily livestock ration.

Agri 211, Introduction to Range Science

Range classification, soils, plant identification, stocking rate determination skills and range management practices. Laboratories involved interaction with field experts from the Soil Conservation Service & Bureau of Land Management.

Agri 265, Agricultural Marketing

Covered principles of marketing, marketing system framework, commodities marketing and putting together marketing plans.

Agri 116 Basic Agricultural Skills and Laboratory

A variety of agricultural skills, soil assessment, livestock reproduction physiology and herd health records

Agri 101, Agricultural /Natural Resource Occupations

Career and job hunting skills, resume writing, methods to determine personnel interests and how to obtain career objectives.

Supervised Undergraduate Teaching- Advisor; Dr. John Pexton

Taught animal reproduction laboratories for the CSU Department of Animal Sciences. Topics included; anatomy, physiology, histology and endocrinology of livestock reproduction.

Professional Working Experience

Professor of Biology, Department of Natural Sciences and Mathematics, Mesa State College,
Grand Junction, Colorado, 81502 8/15/94-present
(970) 482-1165

Instructor, Department of Agriculture, Mesa State College,
Grand Junction, CO 81502 8/18/93-8/15/94

Veterinarian, Bookcliff Veterinary Hospital
564 29 Road, Grand Junction, CO. 81501 1993
(303) 243-3339

Emergency Veterinary Clinician, Emergency Veterinary Hospital
2050 Centennial Boulevard, Eugene, Oregon, 97410 6/92-4/93
(503) 485-0932

Relief Veterinarian, Self employed in Portland, Oregon.
2062 NW Marshall, Portland, Oregon 97209 9/91-7/92

Clinical Veterinarian and Manager, Animal Medical Clinic
1411 SW 14th, Portland, Oregon, 97202 10/89-9/91
(503) 222-1254

Clinical Veterinarian, Tropicana Veterinary Clinic,
2385 E. Tropicana, Las Vegas, Nevada, 89119 8/88-6/89
(702) 736-4944

Professional Affiliations

Colorado State Board of Veterinarians, License 1988-Current
Continuing Education Credits-Current

Association of Laboratory Animal Clinicians-Current

DEA license for Controlled Substances- Current

VECCS, Veterinary Emergency Care Clinicians Society 1992-1995 Grand Junction Veterinary
Association 1993-1994

AVMA, American Veterinary Medical Society 1988-1989

Nevada Board of Veterinary Examiners, License 1988-1994

Oregon Board of Veterinary Examiners, License 1989-1995

SAVMA, Student American Veterinary Medical Society 1984-1988

Scholarship Continuing Education Courses

Western States Veterinary Conference, Las Vegas, Nevada. 1990

Principles of Surgery, Seattle, Washington. 1991

Veterinary Emergency Care Clinicians Conference, San Antonio, Texas. Fall 1992

Computers in our Society, Mesa State College, 1993

Swine Artificial Insemination, Mesa State College, 1993

Cow and Calf Nutrition, Colorado State University, 1994

Veterinary Emergency Care Clinicians Conference, Puerto Vallarta, Mexico. October 12-16, 1995

The Human Anatomy and Physiology Society, Toronto Canada, May 31-June 5, 1997

Diagnostics in Exotic Animal Practice, Colorado State University, June 11-13, 1997

ADAM Software Grant Writing Symposium, Denver, CO June 1997 Attendance at symposium allowed MSC to be eligible for a \$20,000 Adam Software grant. Grant was not awarded to MSC

Biotechnology Theory and Practice, Northern Illinois University, June 1-3, 1998

Biotechnology for Interdisciplinary Sciences, Northern Illinois Univ. June 4-6, 1998

Ecology of the Rockies, Mt. Evans Field station, July 26-30, 1998

American Veterinary Medical Association (AVMA) Annual Conference, SLC, Utah, July 22-26, 2000

6th Annual Current Laboratory Animal Science Seminar & 47th Annual Pathology of Laboratory Animals (POLA), Rockville, MD 2001

AVMA Meeting – Minneapolis MN. -32 credit hours of Continuing education
Maintain Colorado Veterinary license June 2004

Biosafety & Biosecurity training – Four day conference covering the management and design of level 2 & 3 bio-safety level facilities. Colorado State University July 2005

Service

Membership 1996

Who-Who Committee(ended 2002)
Search Committee's
Continuing Ed. Director
Biology Faculty- chaired ecology search
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals

Membership 1997

Chair & Veterinarian, Animal Care and Use Committee (ACUC)
Tri-Beta Honor Society Member
Biology Club/Tribeta; attend annual Regional Conferences
Junior Service League (JSL)(ended 2001)
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
Who-Who Committee(ended 2002)

Membership 1998

MSC Faculty Senate member
MSC Safety Committee(ended 2002)
Biology Club co-Advisor
Tri-Beta Biological Honor Society hosted; Tri-Beta Regional Conference
Wilderness Coalition
Audubon Society- Board member (ended 1999)
Junior Service League (JSL)(ended 2001)
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
Who-Who Committee(ended 2002)

Membership 1999-2000

MSC Faculty Senate member
Vice-President 2002-2003
MSC Safety Committee(ended 2002)
Biology Club co-Advisor
Tri-Beta Biological Honor Society hosted; Tri-Beta Regional Conference
Wilderness Coalition
Audubon Society- Board member (ended 1999)
Junior Service League (JSL)(ended 2001)
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
Who-Who Committee(ended 2002)
American Association of University Professors (AAUP)

Membership 2001-2003

Redlands Mosquito Control Board

MSC Faculty Senate member

Vice-President 2002-2003

FACT representative 2002-2003

MSC Safety Committee(ended 2002)

Biology Club co-Advisor

Tri-Beta Biological Honor Society

Wilderness Coalition

Junior Service League (JSL)(ended 2001)

Science fair -Scientific Review Committee

Science Fair Judge- Botany & Junior Finals

Who-Who Committee(ended 2002)

American Association of University Professors (AAUP)

Membership 2004-2006

GRMCD Grand River Mosquito Control District

Biology Club co-Advisor

Tri-Beta Biological Honor Society hosted; Tri-Beta Regional Conference 2005

Science fair -Scientific Review Committee

Science Fair Judge- Botany & Junior Finals

American Association of University Professors (AAUP)

Academic Policies

Faculty Searches (Botany & Cell Biologist)

Equipment Committee

Travel Committee

Anatomy & Physiology Re-organization Chair

MSC Animal Housing Facility

Veterinarian, Animal Care and Use Committee

Committee is responsible for formulating Animal Care Policy which has been published in a booklet;

MSC Animal Care Handbook editor.

Edited handbook for IACUC. Committee approves/ rejects animal use protocols and oversees the care of animals in the facility.

Doctor of Veterinary Medicine

Responsibilities include:

Assisting Principle investigators in laboratory experiments

Treating sick or injured animals

Overseeing the health of animals in the facility

Maintaining treatment records

Research & Publications

Biological Experiences; A Laboratory Manual for Biology 101L

Fountainhead Press 2006

MSC Animal Care Handbook editor.

Edited handbook for IACUC. Committee approves/ rejects animal use protocols and oversees the care of animals in the facility. 2002

Clinical Practice, Various Veterinary Clinics

Skilled in multiple surgical procedures, anesthesia techniques, venipuncture, diagnostics and handling of a variety of animal species.

Laboratory Technician, Colorado State University Bull Farm

Fort Collins, Colorado, 80523. 8/82 - 5/84 Assisted with electro-ejaculation, semen collection and evaluation of sperm, processed and stored straws for artificial insemination.

Technician, Colorado State University Embryo Transfer

Fort Collins, Colorado, 80523. 5/83 - 9/83 Assisted in laboratory, observed embryo transfer procedure, evaluated cows for signs of stage of estrus.

Externship, Raptor Research and Rehabilitation

University of Minnesota, Saint Paul, Minnesota, 55108. 10/87 Necropsied raptors to determine cause of death.

Curriculum vitae
Forbes I. Davidson, Ph.D.

Biology Department
Mesa State College
Grand Junction, CO 81501
(970) 248-1108
E-mail: davidson@mesastate.edu

4668 Lands End Road
Whitewater, CO 81501
(970) 242-2879

Education

B.S. (Zoology), Oregon State University, 1967
Ph. D. (Zoology), University of Texas at Austin, 1977

Military Service

U.S. Army, 1968-1970

Teaching Experience

Professor, Biology Department, Mesa State College, 2005-present
BIOL 101/101L (General Biology)
BIOL 101H (Honors General Biology)
BIOL 105L (Attributes of Living Systems)
BIOL 141/141L (Human Anatomy and Physiology)
BIOL 209 (Human Anatomy and Physiology—formerly BIOL 141)
BIOL 341/341L (General Physiology)
BIOL 387 (Structured Research; Supervised—no teaching credit)
BIOL 396 (Topics: Biology of Cancer)
BIOL 396 (Topics: Alternative Medicine)
BIOL 396 (Topics in Medicine)
BIOL 441/441L (Endocrinology)
BIOL 482 (Senior Research)
BIOL 483 (Senior Thesis)
BIOL 487 (Independent Research; Supervised—no teaching credit)
BIOL 495 (Independent Study)

Associate Professor, Biology Department, Mesa State College, 2000-2005

Assistant Professor, Biology Department, Mesa State College, 1995-2000

Lecturer, Biology Department, Mesa State College, 1993-1995

Lecturer, Chemistry Department, University of Texas at Austin, 1986-1988
Chemistry 369L (Biochemistry Laboratory; spring semesters only)

Teaching Assistant, University of Texas at Austin, 1977
Developmental Biology Laboratory

Teaching Assistant, Oregon State University, 1970-1971
Histology Laboratory
Microtechnique Laboratory
Developmental Biology Laboratory

Research Experience

- 1995 - 2003: Supervised Mesa State College students in research in whirling disease in salmonid fish, aquatic endocrine disrupters, tumor angiogenesis and aquaporin gene expression
- 1988 -1990: Research Associate, Chemistry Department, UT-Austin.
Immunological detection of Africanized honeybee proteins
- 1986 -1988: Research Assistant, Chemistry Department, UT-Austin
Purification of dUTPase enzyme from rat liver
- 1981 -1986: Research Assistant, Zoology Department, UT-Austin
Electrophoretic identification of rat liver estrogen receptors
- 1979 -1981: Research Assistant, Zoology Department, UT-Austin
Sympatric speciation in tephritid fruit flies
- 1977 -1978: Postdoctoral Fellow, UT-Austin
Antigen expression in chick-quail parabionts

Publications

Tony Schountz, Renata M Green, Bennett Davenport, Amie Buniger, Tiffany Richens, J Jeffrey Root, Forbes Davidson, Charles H Calisher and Barry J Beaty (2004) "Cloning and characterization of deer mouse (*Peromyscus maniculatus*) cytokine and chemokine cDNAs." BMC Immunology 5:1

Davidson, F. (2001) "Lactose intolerance." Article written for Science Technologies (Austin, Texas) for inclusion as sidebar in Boyer's Biochemistry textbook.

Davidson, F. (2000) "Fat blockers." Article written for Science Technologies (Austin, Texas) for inclusion as sidebar in Boyer's Biochemistry textbook.

Davidson, F. (2000) "Ricin and immunotoxins." Article written for Science Technologies (Austin, Texas) for inclusion as sidebar in Boyer's Biochemistry textbook.

Davidson, F. (2000) "Viagra." Article written for Science Technologies (Austin, Texas) for inclusion as sidebar in Boyer's Biochemistry textbook.

Davidson, F., T. Udagawa, E. Verdel and G.B. Kitto (1992) Africanized honeybee specific proteins and their use for immunoassay development. Bee Science, 2: 193-199.

Smith, D. F., Skipper, J. K., Davidson, F. I. and Hamilton, T. H. (1986) "Identification of two forms of the progesterone receptor from chick oviduct cytosol using non-denaturing gel electrophoresis. *J. Steroid Biochem*, 24: 787-793.

Skipper, J. K., Davidson, F. I., Smith, D. F. and Hamilton, T. H. (1985) "Electrophoretic analysis of the estrogen receptor: molybdate stabilization and identification of the classical estrogen receptor." *J. Biol. Chem.*, 260: 5399-5405.

Skipper, J. K., Davidson, F. I., and Hamilton, T. H. (1985) "Electrophoretic analysis of the estrogen receptor: relationship of multiple receptor forms to the molybdate-stabilized form." *J. Biol. Chem.*, 260: 14636-14641.

Davidson, Forbes I. (1977) Ph. D. Dissertation, University of Texas at Austin. "A descriptive and experimental study of amniotic fold formation in the chick embryo."

Abstracts

Kitto, G. B., Davidson, F. Lemburg, J. and Broussard, F. (1991) "Africanized bees come to Texas." *Isozyme Bulletin* 24: 67.

Kitto, G. B., E. Broussard, J. Lemburg, L. Davidson, F. Davidson, W. Rubink and O. Taylor. (1990) "Malate dehydrogenase (MDH) profiles of mexican trapline honeybees prior to africanization." *Isozyme Bulletin* 23: 84

Kitto, G. B., Davidson, F., Broussard, E., Lemburg, J. and Rubink, W. (1990) "Development of biochemical detection methods for Africanized bees." *Am. Bee Journal*, 130: 803.

Kitto, G. B., Davidson, F. I., Udagawa, T. and Lakey, N. (1990) "Identification of three Africanized honey bee specific proteins." *FASEB J.*, 4: A2316.

Kitto, G. B., Davidson, F. and Udagawa, T. (1989) "Development of a biochemical detection method for africanized bees." *Isozyme Bulletin*, 22: 68.

Davidson, F., T. Udagawa, N. Lakey, J. Lemburg and G. B. Kitto. (1989) "Honeybee identification: Characterization of three proteins specific to africanized bees." *Am. Bee Journal* 129: 813-814.

Kitto, G. B., Davidson, F. and Udagawa, T. (1988) "Development of a biochemical detection system for Africanized bees." *Isozyme Bulletin*, 21: 123.

Skipper, J. K., Davidson, F. I., Smith, D. F. and Hamilton, T. H. (1985) "Correlation of electrophoretic and physicochemical forms of the estrogen receptor from rat uteri." *Endocrine Society 67th Annual Meeting (Abstract # 1389)*.

Smith, D. F., Skipper, J. K., Davidson, F. I. and Hamilton, T. H. (1984) "Gel electrophoretic analysis of chick oviduct progesterone receptor." *FASEB J.*, 43: 693.

Hamilton, T. H., Skipper, J. K., Davidson, F. I. and Smith, D. F. (1983) "Multiple forms of estrogen receptor: Effective stabilization by molybdate and heat dependent conversion." Endocrine Society 65th Annual Meeting (Abstract #403).

Skipper, J. K., Davidson, F. I., Smith, D. F. and Hamilton, T. H. (1983) "Rapid separation of the cytoplasmic estrogen receptor from other classes of estrogen-binding proteins." Endocrine Society 65th Annual Meeting (Abstract # 1037).

Davidson, F. (1975) "Ultrastructural and experimental study of chick amniotic fold formation." Am. Zool., 15: 828.

Honors and Awards

Outstanding Teacher Award. 1997. Grand Junction Area Chamber of Commerce Business Education Partnership.

Nominated for (but not awarded) Distinguished Faculty Award (2000, 2001)

Educator of the Year Award, 2002. Grand Junction Area Chamber of Commerce Business Education Partnership.

Mesa State College Distinguished Faculty Award for Teaching, 2002.

Invited Lectures

"Africanized honeybee detection." Honors Colloquium, UT-Austin. 22 July 1989.

"Development of an immunological assay for africanized honeybees." Microbiology Department, UT-Austin. 26 July 1989

"Honeybee or killer bee...that is the question." Texas Pest Control Association Annual Meeting, San Antonio, Texas. 8 December 1989

"From alfalfa to Viagra. Communication in biological systems." Sigma Xi lecture. Mesa State College. 27 September 1999

Professional Affiliations and Activities

Sigma Xi member, 1994-present; treasurer, 1999-present

Council on Undergraduate Research member, 1995-2005; institutional liaison, 1999-2003.

Peer reviewer: Journal of Apicultural Research, American Bee Journal, Bios

Vice-chairman, Science Education section, SWARM-AAAS (1998-1999)

Chairman, Science Education section, SWARM-AAAS (1999-2000)

Symposium co-organizer, SWARM-AAAS meeting at Mesa State College, May, 1998

Book/Chapter reviews

Reviewed 2 chapters in Crivello, Human Anatomy and Physiology (2003)
Reviewed 11 chapters in Mader, Inquiry into Life, 9th edition (1999)
Reviewed 6 chapters in Tobin and Dusheck, Asking about Life, 2nd edition (1998)
Reviewed 1 chapter in Moore, Clark and Vodopich, Botany, 2nd edition (1997)
Reviewed "Plant Life of Colorado National Monument" in Teacher's Education Guide to Colorado National Monument (1998)

Institutional Activities

Premed Advisor, Mesa State College (1998-present)

Wrote proposal to host Council on Undergraduate Research Biennial Meeting at Mesa State College in 2002

Departmental Committee Participation

Chair, Biology search committee, 1998/1999
Member, Electron Microscope Facility committee
Member, Biology Core Curriculum committee
Member, Scholarship Evaluation committee
Member, Program of Excellence committee

Mesa State College Standing Committee Participation

Member, Human Subjects Committee, Mesa State College (1996-2003)
Member, Animal Care Committee, Mesa State College (2000)

Community Activities

Member, GOCO Steering committee for Grand Junction (1995)
Director, Western Colorado Science Fair (1995-2000; 2004)
Member, Institutional Review Board, St Mary's Hospital (2004 - present)

Resume

Dr. Bruce A. Bauerle
Biologist, Vertebrate Zoologist, Marine Ecologist
Professor of Biological Sciences
Mesa State College
1100 North Avenue
Grand Junction, CO 81501-3122
Office Phone: 1-970-248-1684
FAX: 1-970-248-1700
E-mail: bauerle@mesastate.edu

July 2006

Home: 2245 N. 15th St. #B
Grand Junction, CO 81501-4210
Home Phone: 970-243-7084
Cell: (seldom turned on) 970-216-2615
Emergency: (970-257-7894 daughter)

EDUCATION:

Post Doctoral class work in the areas of marine biology (California and Maine), Rocky Mountain flora, Oregon rainforests, ecology and conservation of marine birds and mammals, and mountaineering. Marine ecology experience on six scientific research vessels and naturalist / lecturing experience on over thirteen cruise lines. Extensive world travel to over thirty countries, including Amazonia, Tasmania, Antarctica, New Guinea, and the Galapagos Islands.

University of Northern Colorado. Doctorate of Arts in Zoology and Ecology, 1972.
Dissertation research funded through the Natural Resource Ecology Lab of the International Biology Project, Colorado State University, by the National Science Foundation. Topic: Biological Productivity of Snakes of the Pawnee Site.

Graduate School at the University of Kansas, Lawrence, 1968-69.

Master of Arts in Biology and Education at the University of Missouri, Kansas City, 1967-68.

Bachelor of Science degree in Education in the Biology Concentration program at the University of Kansas, Lawrence, 1963-67.

EXPERIENCE:

Professor of Biological Science at Mesa State College from 1972 to the present. Courses taught include general biology, invertebrate zoology, anatomy, ecology, aquatic biology, ornithology, developmental biology, bioethics, honors field biology, and survival.

Associate Professor of Biology, University of Colorado, Boulder, on the M.V. Universe, Semester at Sea program, cruising completely around the world teaching ecology, 1980. Several days to a week were spent in each of the following countries: Japan, Taiwan, Hong Kong, China, Philippines, Indonesia, India, Egypt, Greece, and Spain.

Assisted in teaching a three week class in Ecuador (cloud forest and lowland rainforests) and

Galapagos Islands (wildlife), 2006. Assistant Professor in a seven-week field biology class in Mexico, Belize, and Guatemala, taught by the University of Northern Colorado, Greeley, 1974.

CRUISE LINE / ECOTOUR GUIDE EXPERIENCE:

Marine Ecology / Naturalist Ecotour Leader and/or Lecturer aboard the following ships*:

1980. M.V. Universe. Professor on the Semester At Sea program. One around-the-world voyage of four months with 12 ports of call (Japan, China, Taiwan, Hong Kong, Philippines, Indonesia, Sri Lanka, India, Egypt, Greece, Spain).

1985. M.V. Rotterdam. Holland American Line, World Cruise. U.S., Hawaii, Philippines, Hong Kong.

1985-86. M.V. Viking Sky. Royal Viking Line, Christmas Cruise. Virgin Islands, Curacao, San Blas, Panama Canal, Mexico, Fort Lauderdale.

1986. M.V. Stardancer. Sundance Cruise Line. Alaska.

1986-87. M.V. Liberte. American Hawaii Line, Christmas Cruise and New Years Cruise. Two weeks in Tahiti, Bora Bora, Morea, and other islands in French Polynesia.

1987. M.V. Stella Solaris. Sun Line Cruises. Puerto Rico, St. Thomas, St. Martin, St. Barthelme, St. Johns, Antigua.

1987-88. M.V. Bermuda Star. Bermuda Star Line, Christmas Cruise and New Years Cruise. Two weeks from U.S., Mexico, Costa Rica, Panama Canal, Columbia, Mexico, U.S.

1988. M.V. Stardancer. Sundance Cruise Line. Two one-week voyages, Alaska.

1989. M.V. Stardancer. Admiral Cruise Line. Two one-week voyages, Alaska.

1990. M.V. Sea Princess. Princess Cruise Line. Australia, New Zealand, Pago Pago, Bora Bora, Moorea, Tahiti.

1990. M.V. Viking Serenade. Royal Viking Line. Two one-week voyages, Alaska.

1991. M.V. Pacific Princess. Princess Cruise Line. Hawaii, Christmas Island, Bora Bora, Tahiti.

1991. M.V. Regent Star. Regency Cruise Line. Four one-week voyages, Alaska.

1991-92. M.V. World Renaissance. Eprotiki Cruise Line. Christmas/New Years two two-week cruises. Martinique, St. Lucia, Bequia, St. Vincent, Tobago, Devil's Island, Belem (Brazil), Amazon Narrows, Santarem, Alter do Chao, Boca do Valerio, and Manaus (all Brazil).

1992. M.V. Regent Star. Regency Cruise Line. Four one-week voyages, Alaska.

1992. M.V. Universe World Explorer Cruises. Two ten-day cruises, Alaska.
1993. M.V. Regent Star. Regency Cruise Line. Two one-week voyages, Alaska.
1993. M.V. Regent Star. Regency Cruise Line. Jamaica, Costa Rica, Columbia, Aruba.
- 1993-94. M.V. Columbus Caravelle. Transocean Cruise Line. One nineteen-day voyage, Antarctica. Chile, Falkland Islands, South Georgia Island, Antarctica, Cape Horn, Beagle Channel, Chile.
1994. M.V. American Adventure. American Adventure Cruise Line. Two one-week voyages. U.S., Bahamas, Dominican Republic, U.S.
1994. M.V. Regent Sea. Regency Cruise Line. Two one-week voyages, Alaska.
1995. M.V. Regent Sea. Regency Cruise Line. Mexico, Costa Rica, Panama Canal, Columbia, Jamaica.
1996. M.V. Royal Odyssey. Royal Cruise Line. One two-week voyage. Aruba, Costa Rica, Panama Canal, Mexico, U.S.
1998. M.V. Galapagos Adventure. One ten-day voyage as naturalist/guide in Galapagos Islands, Ecuador.
1999. M.V. Mistral. One seven-day voyage as naturalist/guide in Galapagos Islands, Ecuador.
2000. M.V. Galapagos Adventure II. "Millenium Voyage." One seven-day voyage as naturalist/guide in Galapagos Islands with an additional four days in Quito, Ecuador.
2000. M.V. Regal Princess. Two one-week voyages as naturalist in Alaska.
2002. M.V. Dawn Princess. Four one-week voyages as naturalist in Alaska.
- 2003-04. M.V. Splendor of the Seas, Royal Caribbean Cruise Line. Twelve-day Christmas/New Years voyage as naturalist to Mexico, Grand Cayman, Belize, Honduras, Panama Canal, Costa Rica.
2004. M.V. Dawn Princess. Four one-week voyages as naturalist in Alaska.
2005. M.V. Regal Princess. Three ten-day voyages as naturalist in Alaska.
2006. M.V. Diamond Princess. Four seven-day voyages as naturalist in Alaska.

*The above trips include professional travel only. Extensive personal travel has also taken place to more destinations than can conveniently be listed.

OTHER EXPERIENCE:

Survival lecturing for various agencies and industries, including: Mountain Bell Telephone, U.S. Bureau of Land Management, Western States Natural Gas, St. Mary's Air-Life Helicopter Staff, U.S. Bureau of Reclamation, Public Service Company of Colorado, Grand Junction Chamber of Commerce, etc.

Aspen Center for Environmental Studies; Aspen, Colorado. Guest Professor, "Mountain Winter Ecology," taught on cross country skis, spring 1986. Vail "Ecology Institute" for teachers, taught in the high mountain ecosystems, summer 2002.

Extensive public speaking experience at all levels of business, industry, and education in Western Colorado. Lecture/slide show presentations for large groups, clubs, organizations, and high school/junior high/grade school classes on topics such as rainforests, coral reefs, whales, seals, sharks, otters, marine fisheries, Galapagos Islands, Antarctica, Alaska, New Guinea, Australia, Amazonia, etc. A number of travel/adventure colloquia have been presented for the faculty and staff at Mesa State College. Numerous "Wednesday Night Wandering" outdoor-adventure community slide shows sponsored by the Mesa State College Outdoor Program.

Citation from the City of Grand Junction and the Grand Junction Police Department for heroic actions in saving the life of Mrs. G. Mooney (from drowning in an ice-filled irrigation canal, at great personal risk) in April, 1980. TV media exposure for saving a second victim from drowning in 1996.

Continuous experience in curriculum development; including interdisciplinary classes (San Juan Symposium), graduate student courses (How to Give Nature Hikes in the Elementary Schools), (A Snowshoe Nature Hike on Grand Mesa) and mountaineering classes (Survival), as some examples.

Experienced backpacker, sea kayaker, white water kayaker, rock climber, snowboarder, windsurfer, and cross country/telemark/downhill skier. Certified scuba diver. Experienced photographer, above and below water.

Environmental impact study experience at Fort St. Vrain nuclear power plant in Colorado, and Glenrock, Wyoming, coal-fired power plant concerning ecophysiological effects of environmental pollutants on vegetation.

Outstanding success at "community service" projects over the long term. Early advocate for the establishment of bicycle lanes, North Avenue beautification, new sign codes, a greenbelt/connected lakes urban trail system, and moose reintroduction—all of which were eventually completed in the Grand Junction area.

Kannah Creek Basin Assessment. Inventoried various human impacts and the occurrence of threatened and endangered species, for the U.S. Forest Service, Grand Mesa District, 1981.

Unsigned student evaluations concerning lecturing ability, interest level, grading, etc., normally average 4.5 or above on a 5.0 possible scale.

Faculty committees include being elected to the Faculty Senate, the Salary Committee, the Grievance Committee, chairmanship of the Promotion and Retention Committee, chairmanship of the Tenure and Promotion Committee, and the Lectures and Forums Committee.

Selected as "Outstanding Educator" for 1999 by the Grand Junction, Colorado area Chamber of Commerce.

Selected again in 2003 as "Outstanding Educator" by the Chamber of Commerce of Grand Junction. (Only one other person has been selected twice for this honor.)

Received the "Distinguished Faculty Award" for the year 2000 (Mesa State College's 75th Anniversary). This is the highest honor the college can bestow upon a member of its faculty and came with medallion, plaque, and a \$2,000 stipend.

OF INTEREST:

In September of 1982, my rather unique survival class was featured in a half-page article in the Japanese version of *Sports Illustrated Magazine* and in a five-page article in another popular Japanese Magazine, *Heibon Panch*. In July of 1986, *Heibon Panch* featured my urban survival techniques in a ten-page magazine article. The very first issue of a new Japanese magazine, *Survival*, featured a seven-page article about my survival class and teaching techniques in April, 1986.

My article, "Athletes Too Often Learn Risk of Injury Only by Experience," was published in the *Rocky Mountain News* and numerous other Scripps-Howard newspapers across the United States on Sunday, Dec. 28, 1986. It was subsequently picked up by the Associated Press and published in the *National Collegiate Athletic Association News*, Jan. 14, 1987.

My publication, "Emergency Drinking Water Collected from Plants," was selected to be used as a script by the Developing Countries Farm Radio Network, and has been translated and read over the air in 207 dialects and languages worldwide.

I have had many exciting experiences living and camping on the coasts of Mexico, Canada, Europe, Australia, Tasmania, etc., etc., doing diving, sea kayaking, wind surfing, and other adventurous sports while studying local wildlife and botany.

PUBLICATIONS:

- Bauerle, Bruce. 1991. "Emergency Drinking Water Collected from Plants: a Non-Destructive Technique for Survival in Arid Lands." *AT Source*, a quarterly magazine on technology and development. Vol. 19, No. 3. Netherlands. Originally published in both French and English.
- Bauerle, Bruce. 1987. "Escape From the Classroom (How to Give Nature Hikes)." *Science and Children*; Journal of the National Science Teachers Association of the NEA. Oct., Vol. 25, No. 2.
- Bauerle, Bruce. 1986. "Disaster in the Laboratory: the Poison Gas Crisis." *Journal of Chemical Education*. Vol. 63, p. A188. American Chemical Society.
- Trlica, M. J., R.D. Child and B.A. Bauerle. 1985. "Leaf Injury and Elemental Concentrations in Vegetation Near a Coal-Fired Power Generating Station." *Journal of Water, Air and Soil Pollution*. April, Vol. 24, No. 4, pp. 375-396.
- Bauerle, Bruce. 1983. *Shiti Sabaibaru (Urban Survival)*. Japanese edition by Yamate Shobo Publishers. This book sold more than 6,000 copies in the first four months.
- Bauerle, Bruce. 1982. *Urban Survival*. Sentinel Printing Company, Colorado. 188 p.
- Fitzgerald, J.P., B. Bauerle, et al. 1982. *Small Mammals, Furbearers, and Small Game Animals of Northwestern Colorado—a Review and Synopsis of Information*. BLM. U.S. Depart. of the Interior. 290 p.
- Bauerle, Bruce, David L. Spencer and William Wheeler. 1975. "The Use of Snakes as a Pollution Indicator Species." *Copeia*. 2:366-368.
- Trilica, M.J., B.A. Bauerle, L.F. Brown and R.D. Child. 1974. *Ecophysiological Characteristics of Vegetation Surrounding the Fort St. Vrain Nuclear Generating Power Plant*. Thorne Ecological Institute, Boulder, Colorado. 54 p. (Rights to this publication are restricted by Public Service Company of Colorado.)
- Bauerle, Bruce. 1972. "Biological Productivity of Snakes of the Pawnee Site." *U.S. IBP Grasslands Biome Tech. Rep. No. 207*. Colo. State Univ., Fort Collins. 71 p.
- Bauerle, Bruce and D.L. Spencer. 1971. "Environmental Pollutants in Two Species of Snakes from the Pawnee Site." *U.S. International Biology Project Grasslands Biome Tech. Rep. No. 137*. Colo. State Univ., Fort Collins. 15 p.

LOCAL (COMMUNITY) PUBLICATIONS:

Bauerle, Bruce and Duane Hrcir. 2005. *A Snowshoe Hike on Grand Mesa, Including Landmarks Along the Road and Comments on Plants and Wildlife*. Free download at www.mesastate.edu/schools/snsm/biology/index.htm.

SCIENTIFIC PAPERS PRESENTED:

Bauerle, Bruce. 1989. "Collection of Drinking Water for Human Consumption from Live Arid and Saline Vegetation: a Non-Destructive Technique." *Journal of the Colorado-Wyoming Academy of Science*. Vol. XXI, No. 1.

RESEARCH INTERESTS:

I have a special interest in development of interesting "biological" ecotourism presentations (slides/lectures/displays) that may be utilized in courses taught at Mesa State College and in local schools/communities, as well as for use on cruise ships. I enjoy developing and teaching unique survival skills for the layman relating to biological, chemical, and nuclear disasters and terrorist attacks.

SABBATICAL LEAVE:

Sabbatical leave was granted from Mesa State College for the spring and summer semesters of 1990. Unique organisms and ecosystems in Fiji, Australia, New Zealand, Pago Pago, and Tasmania were investigated and photographed (including marine systems such as the Great Barrier Reef). These five months were spent backpacking, usually alone, into some pretty interesting places.

Aparna Dileep~Nageswaran Palmer, Ph.D.

PERSONAL

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Telephone:	(970) 248-1984	(970) 263-4148
E-mail address:	aparna@mesastate.edu	
Date and Place of Birth:	January 21, 1970 in Srirangam, India	
Citizenship:	United States of America	

EDUCATION

- Ph.D. in Zoology**, Department of Zoology, Washington State University, Pullman, Washington. Molecular Phylogenetics and Character Evolution of Polychaetous Annelids and their Allies. August 1999. Thesis Advisor: P.C. Schroeder.
- B.A. in English, magna cum laude.** Department of English, Colorado State University, Fort Collins, Colorado. May 1993.
- B.S. in Biological Sciences, cum laude.** Department of Biology, Colorado State University, Fort Collins, Colorado. May 1993.

PROFESSIONAL EXPERIENCE

- Director**, Academic Honors Program. Fall 2005-present.
- Associate Professor**, Department of Biological Sciences, Mesa State College. Instructor in Principles of Animal Biology, Marine Biology, Marine Invertebrate Communities, General Biology, Evolution, Freshman Year Initiative, Invertebrate Zoology, Nature of Science, Natural History of the Pacific Northwest Coast, Senior Thesis, and Attributes of Living Systems. Fall 2004-present.
- Assistant Professor**, Department of Biological Sciences, Mesa State College. Fall 1999-Spring 2003.
- Graduate Teaching Assistant**, Department of Zoology, Washington State University. Teaching Assistant in Invertebrate Zoology, Developmental Biology, Contemporary Issues in Biology, Cell Physiology, Introductory Biology; and General Zoology. Fall 1994-Summer 1999.
- Visiting Academic Faculty Member**, Department of Biological Sciences, University of Idaho. Lecturer in Invertebrate Zoology. Spring 1996.
- Instructor**, Department of Arts and Sciences, Morgan Community College, Fort Morgan, Colorado. Instructor of Speech Communication and Advanced Writing Skills. Spring 1994.
- ESOL (English to Speakers of Other Languages) Program Coordinator and Lead Teacher**, Morgan Community College, Fort Morgan, Colorado. Supervisor and Lead Teacher of the Intensive English Program. August 1993-May 1994.

Professional Experience, continued

Undergraduate Lecture and Laboratory Teaching Assistant, Honors Biology, Department of Biology, Colorado State University. Designed and taught labs on Invertebrate Zoology, Freshwater Ecology, Plant and Animal Biology, and Nature Writing. August 1988-May 1993. Advisor: M. Nabors.

Undergraduate Teaching Assistant, Classical Greek Language, Department of History, Colorado State University. Tutored students and evaluated student performance. Fall 1992. Advisor: J. Jordan.

GRANTS, SCHOLARSHIPS, AND HONORS

City of Grand Junction Excellence in Teaching Award, Spring 2005.

Academic Enrichment Fund, Mesa State College, Fall 2004, Fall 2002, Fall 1999.

Bruce Dixon Scholar and Mentor Award, Mesa State College, Fall 2000.

OSC Grant, Office of State Colleges, Colorado, Fall 2000.

Biggs-Zollner Grant, Mesa State College Foundation, Spring 2000.

Graduate Student Travel Grant, Graduate School, Washington State University, Spring 1998.

Sigma-Xi Grant-In-Aid of Research, Sigma Xi, Spring 1998.

Guy Brislawn Graduate Student Award and Scholarship (for outstanding achievement in teaching and/or research), Department of Zoology, Washington State University, 1997.

Graduate Student Minigrant, College of Sciences, Washington State University, 1996 (matching awarded by the Department of Zoology at WSU)

Lerner-Gray Marine Fund Grant, American Museum of Natural History, 1996.

Edward Meyer Minigrant, College of Sciences, Washington State University, 1996 (P.I.: P.C. Schroeder).

Graduate Student Teaching Assistantship, Department of Zoology, Washington State University, August 1994-present.

University Honors Program Scholar, Colorado State University. August 1987-May 1993.

University Honors Program Scholarship, Colorado State University, Spring 1992.

Phi Beta Kappa Scholar, Colorado State University. August 1992-present.

Colorado Merit Work Study Recipient, Colorado State University, August 1988-May 1993.

Hewlett-Packard Scholarship, Colorado Springs Division, Colorado. Fall 1987.

PUBLICATIONS

Dyer, L., and A.D.N. Palmer. Eds. 2004. Piper: A model genus for studies of chemistry, ecology, and evolution. Kluwer/Plenum Academic Press. New York.

Herbst, M., Prescott, J., Palmer, A.D.N., and Schountz, T. 2002. Sequence and expression analysis of deer mouse interferon-gamma, interleukin-10, tumor necrosis factor, and lymphotoxin-alpha. Cytokine 17 (4): 203-213.

Palmer, A.D.N. 2000. Phylogenetic analysis and the evolution of reproductive strategies within the Syllidae (Annelida: Polychaeta). Bulletin of Marine Science 67(1): 671.

Palmer, A.D.N. 1999. Molecular Phylogenetics and Character Evolution of Polychaetous Annelids and their Allies. Washington State University. (dissertation)

Curriculum Vitae

2002

NAME

Richard Craig Dujay

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970-248-1690	MSC office
970-640-4671	Cell

ELECTRONIC MAIL

dujay@wpogate.mesastate.edu

DATE OF BIRTH

March 15 1957

EDUCATION

Ph. D. Zoology concentrations in Ecology, Cell Biology and Population Genetics. Colorado State University, 1998.
Masters of Science, Zoology, concentrations in Electron Microscopy and Genetics. Colorado State University, 1994.
Bachelor of Science, Biological Science. Colorado State University, 1993.
Associates of Arts. North Harris College, 1991. (w/Honors).
Associates of General Studies. North Harris College, 1991. (w/Honors).
Peace Officer. Houston Community College, TX, 1983. (Dean's List).
Paramedic, University of Texas School of Allied Health Sciences, 1980.
Firefighter. Houston Community College, TX, 1975.

HONORS AND AWARDS

Who's Who Historical Society 2001 - 2002
Marquis Who's Who 2000-2001.
Lexington's Who's Who Life Time Award.
Best Graduate Student Presentation. Annual meeting of the SWARM Division of AAAS, Mesa State College, Grand Junction , Colorado. 1998.
Graduate Student Fellowship, Colorado State University, 1994.
Honors Graduate, North Harris College, 1991.
Dean's List, North Harris College, 1991.
Dean's List Houston Community College, 1983.

Curriculum Vitae

ASSOCIATIONS

Gamma Sigma Delta, The Honor Society for Agriculture.
Southwestern and Rocky Mountain Division of the American Association
for the Advancement of Science.
Colorado/Wyoming Academy of Science.
Zoological Society of the Rockies.
Colorado State University Chapter of the National Wildlife Society.
National Wild Turkey Federation.
National Audubon Society.
Masonic Lodge.

OFFICES HELD

President and Treasurer for the Colorado/Wyoming Academy of Science.
Scientific Coordinator for the Western Investigations Team (WIT) in
conjunction with the Museum of the West Grand Junction,
Colorado
Chair of the Electron Microscope Committee, Mesa State College.
Manager of Animal Care Facility, Mesa State College.
Director of the Center for Microscopy, Mesa State College.
Forensics Minor Committee Member
National Audubon Society. Grand Valley Chapter. Member, Board of
Directors, Chair of Interns.

PROFESSIONAL EXPERIENCE

Lecturer of Biology, and Director of the Center for Microscopy, Manager
of the Animal Care Facility Mesa State College, August 1998 –
present.
Wildlife Biologist and Consultant, **Wild Diversity™** Grand Junction,
Colorado, 2000 - present..
Teaching Assistant, Field Biology, Colorado State University,
1998.
Wildlife Research Assistant, Colorado Division of Wildlife Avian
Research Center, Fort Collins, Colorado, 1994 - 1998.
Teaching Assistant Developmental Biology, Colorado State University,
1996.
Teaching Assistant Cellular Biology, Colorado State University, 1994 –
1996.
Teaching Assistant, Humans and Other Species, Colorado State University
1992 – 93.
Firefighter/Paramedic, Houston Fire Department/Hazardous Materials
Response Team, 1983 – 91.
Commissioned Peace Officer, State of Texas, 1983 - 1987.
Paramedic, Houston Fire Department, 1980 – 1983.
Firefighter, Houston Fire Department, 1975 – 1980.

Curriculum Vitae

ABSTRACTS AND PUBLICATIONS

- Dujay, Richard C. 1993. EFFECTS OF AGE AND GENOTYPE ON ALCOHOL REACTIVITY IN MICE. Colorado/ Wyoming Academy of Science, Denver, Colorado.
- Dujay, Richard C. 1993. GENETIC BASIS FOR COAT COLOR IN DOGS AND SELECTIVE BREEDING. Graduate Student Symposia, Colorado State University Fort Collins, Colorado.
- Dujay, Richard C., D.M. Gilliam, R.S. Ackley, and Donald J. Nash. 1994. THE EFFECTS OF PRENATALLY ADMINISTERED COCAINE ON AUDITION IN MICE. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Durango, Colorado. Master's Thesis.
- Dujay, Richard C., Ali Alyaseri, and Donald J. Nash. 1994. EFFECTS OF AGE AND SEXUAL EXPERIENCE ON SEXUAL BEHAVIOR IN MICE WITH THE QUINKY MUTATION. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Durango, Colorado.
- Nash, Donald J., Richard C. Dujay. 1994. THE EFFECTS OF THE MICROPHthalmic WHITE GENE ON AUDITION IN MICE. Jackson Laboratories, Bar Harbor, Maine.
- Dujay, Richard C. 1995. TAEKWONDO; HANDBOOK FOR STUDENTS AND INSTRUCTORS. STC Publishing Comp. Fort Collins, Colorado.
- Dujay, Richard C. 1995. MANAGEMENT OF LARGE MAMMAL POPULATIONS ON PRIVATE RANCH LANDS. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Oklahoma City, Oklahoma.
- Dujay, Richard C. 1995. GENETIC DIVERSITY AMONG POPULATIONS OF MERRIAM'S WILD TURKEYS IN COLORADO. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Oklahoma City, Oklahoma.
- Dujay, Richard C. D. J. Nash, Moses Schandfiel. 1996. DNA EXTRACTION FROM WHOLE AVIAN BLOOD. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Flagstaff, Arizona.
- Dujay, Richard C., D. J. Nash, Richard Hoffman. 1996. GENETIC DIVERSITY OF COLORADO'S MERRIAM'S WILD TURKEY. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Flagstaff, Arizona.
- Dujay, Richard C., Fernando Torres, D. J. Nash. 1996. THE AUTOSOMAL HAIRLOSS MUTATION IN MICE. Jackson Laboratories, Bar Harbor, Maine.

Curriculum Vitae

- Dujay, Richard C., D. J. Nash. 1997. NON-ISOTOPIC RFLP'S OF COLORADO'S MERRIAM'S WILD TURKEYS. . Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Texas A & M University College Station, Texas.
- Dujay, Richard C., D. J. Nash. 1997. THE EFFECTS OF STRINGENCY CONDITIONS ON THE M13 PROBE IN RELATION TO NON-ISOTOPIC RFLP'S OF WILD TURKEYS. Texas A & M University College Station, Texas.
- Dujay, Richard C. 1997. MANAGEMENT OF COLORADO'S MERRIAM'S WILD TURKEYS IN A FRAGMENTED ENVIRONMENT. Texas A & M University College Station, Texas.
- Dujay, Richard C. 1998. GENNETIC RELATIONSHIPS BETWEEN AND AMONG FRAGMENTED POPULATIONS OF COLORADO'S MERRIAM'S WILD TURKEYS. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Mesa State College, Grand Junction , Colorado.
- Dujay, Richard C. 1998. THE M13 PROBE COMPARED TO SYNTHETIC OLIGONUCLEOTIDE PROBES VARYING HYBRIDIZATION CONDITIONS. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Mesa State College, Grand Junction , Colorado.
- Dujay, Richard C. 1998. UPLAND GAME BIRD MANAGEMENT ON COLORADO'S WESTERN SLOPE. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Mesa State College, Grand Junction , Colorado.
- Dujay, Richard C. 1998. NON-ISOTOPIC RFLPs OF COLORADO'S MERRIAM'S WILD TURKEYS. Ph.D. Dissertation
- Kosanke, K. L., Richard C. Dujay. 2000. PARTICLE MORPHOLOGY - METAL FUELS. Journal of Pyrotechnics, No. 11.
- Murphy, Willow, Walter A. Kelly and, Richard C. Dujay. 2000. NUTLET MORPHOLOGY AND THE USE OF SEMs TO DETERMINE CHARACTERISTICS FOR IDENTIFICATION OF SPECIECIES IN THE GENUS *CRYPTANTHA* LEHM. Ex g. DON SECTION *OREOCARYA* (E. GREENE) PAYSON. Microscopy Today, 00-6.
- Kosanke, K.L., B.L. Kosanke, and Richard C. Dujay. 2000. PARTICLE MORPHOLOGY—LOW MELTING POINT OXIDIZERS. Journal of Pyrotechnics, No. 12.
- Dujay, Richard C. 2001. ALFERD PACKER, THE SAN JUAN CANNIBAL. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science Annual Meeting. University of Northern Texas, Denton, Texas.

Curriculum Vitae

- Dujay, Richard C. 2001. ALFERD PACKER; THE SEARCH FOR 127 YEAR OLD EVIDENCE. Colorado - Wyoming Academy of Science Annual Meeting. University of Colorado at Colorado Springs, Colorado Springs, Colorado.
- Kosanke, K.L., B.L. Kosanke, and Richard C. Dujay. 2001. PYROTECHNIC REACTION RESIDUE PARTICLE IDENTIFICATION BY SEM/EDS. Journal of Pyrotechnics, No. 13.
- Dujay, Richard C., K.L. Kosanke, 2001. MANUFACTURING AND PROCESSING TECHNIQUES AFFECTING MORPHOLOGY OF PYROTECHNIC OXIDIZER PARTICLES. Microscopy Today, 10-4.
- Kosanke, K.L. and Richard Dujay. 2001. FORENSIC IDENTIFICATION OF PYROTECHNIC REACTION RESIDUE PARTICLES. Microscopy Today, 10-07.
- Dujay, Richard C. et al. 2001. EDS INVESTIGATION INTO THE LEGEND OF CANNIBAL ALFERD PACKER OF COLORADO. Microscopy Today. 10-09.
- Kosanke, K. L., B. J. Kosanke, and Richard C. Dujay. 2002. IDENTIFICATION OF PYROTECHNIC REACTION RESIDUE PARTICLES BY SEM/EDS. Journal of Forensic Science.
- Fandrich, Joseph, and Richard C. Dujay. 2002. SECONDARY MELT CHARACTERISTICS: EVIDENCE SUPPORTING AN EXTRATERRESTRIAL PROVENANCE FOR WESTWATER, UTAH, MICROSOPHERULES. 54th Annual Meeting of the Geological Society of America for the Rocky Mountains. Denver, Colorado.
- Fandrich, Joseph, and Richard C. Dujay. 2002. AN EXTRATERRESTRIAL ORIGIN FOR WESTWATER, UTAH MICROSOPHERULES DETERMINED BY IDENTIFICATION OF SECONDARY MELT CHARACTERISTICS. Annual meeting of the USGS. Colorado Springs, Colorado.
- Dujay, Richard C. 2002. INTRODUCTION TO SCANNING ELECTRON MICROSCOPY. ISBN 1-58692-471-0. Erudition Books, North Chelmsford, MA.
- Fandrich, J.W. and Richard C. Dujay. 2003. SECONDARY MELT ORNAMENTATION ON WESTWATER, UTAH MICROSOPHERULES: EVIDENCE OF AN EXTRATERRESTRIAL PROVENANCE. Microscopy Today, 11-01.
- Dujay, Richard C. 2003. LABORATORY GUIDE AND FIELD KEY TO THE SKULLS OF NORTH AMERICAN LAND MAMMALS. ISBN 1-593990005-7. XanEdu Books, Ann Arbor, MI.
- Dujay, Richard C. 2004. MICROSCOPIC INVESTIGATION OF THE AUTOSOMAL HAIRLOSS (HL) MUTATION IN MICE. Annual meeting of SWARM-AAAS. Denver, Colorado.

Curriculum Vitae

Fandrich, J.W., Richard C. Dujay. 2004. MICROSHPERULES IN THE BLACK DRAGON BRECCIS, BLACK DRAGON MBR. OF THE MOENKOPI FM., SAN RAFAEL SWELL, UTAH: EVIDENCE SUPPORTING A BOLIDE IMPACT EVENT HORIZON NEAR THE PERMIAN/TRIASSIC BOUNDARY. Annual meeting of SWARM-AAAS. Denver, Colorado.

Fandrich, J.W., Richard C. Dujay. 2004. MEGATSUNAMITE/SEISMITE CHERT BRECCIA DEPOSITS IN THE BLACK DRAGON/HOSKINNINI MEMBER OF THE MOENKOPI FORMATION OF SOUTHEASTERN UTAH: EVIDENCE SUPPORTING A BOLIDE INPACT ON WET TARGET EVENT AT END PERMIAN/LOWER TRIASSIC. Annual meeting of the Colorado/Wyoming Academy of Science. Greeley, Colorado.

Curriculum Vitae
Thomas R. Walla
Department of Biology
Mesa State College
Grand Junction, CO 81501
Tel: (970) 248-1146
email: twalla@measastate.edu

EDUCATION: B.A. Economics, John Muir College, University of California,
San Diego (1991).
Ph.D. Department of Biology, University of Oregon, Eugene OR (2000).

LANGUAGES: Fluent written and spoken Spanish.

EMPLOYMENT:

- 2005 – present Associate Professor, Mesa State College
- 2001 - 2005: Assistant Professor, Mesa State College
- 2000: Instructor, University of Oregon: Ecology
- 1995-2000: Laboratory Instructor, University of Oregon

TEACHING EXPERIENCE:

Course Instructor: Plant-Animal Interactions 406; Advanced Ecological Methods 405; Advanced Ecological Methods Lab 405L; Tropical Ecosystems 415; Entomology 331; Entomology Lab 331L; General Human Biology 101; General Human Biology Lab 101L; Ecology 370; Genetics and Ecology Lab 264L; Genetics and Evolution Lab 261; Forest Biology Lab 307L; Children's Environmental Trust Rainforest Ecology Workshop (K-12).

Graduate Teaching Fellowships: Introduction to Cell Biology 211; Biodiversity 375; Pollination Biology 399; Conservation Biology 483/583; Summer Outreach in Science 1997,1998.

International Instruction: Tropical Field Biology 396. Designed and instructed a two-week summer field course in Ecuador 2002 for Mesa State College.

DOCTORAL DISSERTATION:

- Dissertation Title: "Neotropical Fruit-Feeding Nymphalid Butterflies: Temporal and Spatial Measures of Diversity and Community Dynamics"
- Trained in experimental design and detailed statistical analysis of biodiversity data including: sampling techniques, laboratory preparation and identification of butterfly and ant specimens, and analysis of data for publication.

RESEARCH EXPERIENCE:

- Directed an extensive seven year inventory study of fruit-feeding nymphalid butterflies in the canopy and understory of a tropical rainforest in Eastern Ecuador. Also hired, trained and supervised undergraduate students and indigenous workers in investigation techniques and data collection for this project.
- Managed a three year baseline of diversity information for the area around La Selva Lodge including: inventories of reptiles, birds, herpetofauna, overall butterfly diversity, and botanical collections.

PROFESSIONAL AFFILIATIONS:

President: Population Biology Foundation; **Chair:** Western Colorado Center for Tropical Research

Research Associate: Yana Yacu Biological Station, Ecuador; El Monte Biological Station, Ecuador; La Selva Lodge Biological Station, Ecuador

AWARDS:

Co- Principle Investigator: National Science Foundation: Biological Surveys and Inventories: Caterpillars and Parasitoids of the Eastern Andes. (see www.caterpillars.org)

Biggs-Zollner Faculty Enrichment Grant (2002)

Academic Enrichment Fund (2002,2003, 2004) Professional Presentation Fund (2003)

PUBLICATIONS OF THOMAS WALLA

- Greeney, HF, M Lysinger, TR Walla, & J Clark 1998. First description of the nest and egg of the Tanager Finch (*Orreothraupis arremenops*) with additional notes on behavior. *Ornitologia Neotropical* 9: 205-207.
- DeVries, P.J., T. Walla & H. Greeney. 1999. Species diversity in spatial and temporal dimensions of fruit-feeding butterflies from two Ecuadorian rainforests. *Biol. J. Lin. Soc.* 68: 333-353.
- DeVries, P.J., C.M. Penz and T.R. Walla. 1999. The biology of *Batesia hypochlora* from an Ecuadorian rainforest (Lepidoptera, Nymphalidae). *Tropical Lepidoptera* 10: 43-46.
- Lande, R., DeVries, P.J. & T.R. Walla. 2000. When species accumulation curves intersect: ranking diversity using small samples. *Oikos* 89:601-605.
- DeVries, P.J. & T.R. Walla. 2001. Long-term spatial and temporal species diversity in a neotropical fruit-feeding nymphalid butterfly community. *Biol. J. Lin. Soc.* 74: p.1-15
- Engen,S., Walla T.W., DeVries, P.J. 2002. Analyzing spatial structure of communities by the two-dimensional Poisson lognormal species abundance model. *American Naturalist*.
- Walla, T.R., Engen S., DeVries, P.J., Lande, R. 2004. Modeling Vertical Beta Diversity in Tropical Butterfly Communities. *Oikos*

Curriculum Vitae

NAME: Steven D. Werman, Ph.D.

POSITION:

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EDUCATION

Research Fellow in Molecular Biology, California Institute of Technology 1986-89
Ph.D. 1986 Biology, University of Miami, Florida
M.S. 1980 Biology, California State University, Long Beach
B.S. 1977 Zoology, California State University, Long Beach

WORK EXPERIENCE

Department Head, Biological Sciences 2004-2005
Assistant Dean, School of Natural Sciences and Mathematics Dec 2003- Mar 2005
Professor and Chair, Department of Biological Sciences, MSC. 1997-2003
Associate Professor, Department of Biology Mesa State College, 1993-1997
Assistant Professor, Department of Biology, Mesa State College, 1989-1993
Lecturer in Molecular Biology, Department of Biology, California State University,
Dominguez Hills, CA, 1989
Lecturer in Developmental Biology, Department of Biology, University of Miami, 1984-86
Lecturer in General Biology, Department of Biology, University of Miami, 1983

AREAS OF SPECIALIZATION

Herpetology, Molecular Genetics, Evolution, Systematics, Biogeography, Tropical Biology

RESEARCH AREAS/INTERESTS

My research has focused on the systematics, biogeography and evolution of Neotropical reptiles. I have used information of morphology, allozymes and DNA sequence information to generate hypotheses of relationship among pitvipers using cladistic methods. These relationships have been used to refine and understand the systematics, evolution and biogeography of these reptiles. I am also interested in the genetic analysis of gene flow and species differentiation in amphibians.

RECENT PUBLICATIONS

- Werman, S.D. 2007 Rattlesnake phylogeny and the evolution of neurotoxic phospholipases in rattlesnake venoms. *In: The biology of the rattlesnakes*. Hayes, W., et al. eds. Loma Linda University Press, Calif. (in press).
- Werman, S. D. 2005. Hypotheses on the historical biogeography of bothropoid pitvipers and related genera of the Neotropics. Pp. 306-365 *In: Ecology and evolution in the tropics: A herpetological perspective*. Donnelly, M., et al.eds. University of Chicago Press, Chicago IL.
- Werman, S. D. 2001. Book review: A field guide to the amphibians and reptiles of the Maya World. By Julian C. Lee. *Copeia* 2001 (2): 580-582.
- Werman, S. D. 1999. Molecular phylogenetics and morphological evolution in Neotropical pitvipers: An evaluation of mitochondrial DNA sequence information and the comparative morphology of the cranium and palatamaxillary arch. *Kaupia* 8:113-126.
- Werman, S. D. , Crother, B. I. and M. E. White. 1999. Phylogeny of Some Middle American pitvipers based on 12S and 16S mitochondrial DNA sequence information. *Cont. Herp.* 1999(3) 14pp.
- Werman, S. D. 1997. Systematic implications of lactate dehydrogenase isozyme phenotypes in Neotropical pitvipers (Viperidae: Crotalinae). Pp. 79-88. *In. Venomous Snakes: Ecology, evolution and snakebite*. Thorpe, R. S., Wuster, W. and A. Malhotra (eds.). *Symp. zool. Soc. Lond. No.70*, Oxford University Press. 276 pp.
- Qaddour, J. S., Werman, S. D., and P. Misra. 1997. A singularly perturbed mathematical model of bacterial gene regulation (Lac Operon). *Proc. of I.E.E.E. Singapore Int. Symp. on Control Theory and Appl.* 1: 374-378.
- Werman, S. D., Springer, M. S. and R. J. Britten. 1996. Nucleic Acids I: DNA-DNA Hybridization. Pp. 169-203 *In Molecular Systematics*. Second edition. Hillis, D. M., Moritz C. and B. K. Mable (eds.), Sinauer Assoc. Sunderland, MA, USA. 655 pp.
- Werman, S. D. 1992. Phylogenetic relationships of Central and South American pitvipers of the genus *Bothrops (sensu lato)*: Cladistic analyses of biochemical and anatomical characters. Pp. 21-40 *In. Biology of the Pitvipers*. Campbell, J. A. and E. D. Brodie, Jr. (eds.), Selva, Tyler, Texas. 467 pp.

COURSES TAUGHT

Anatomy and Physiology Lab, BIOL 209L
Developmental Biology, BIOL 310/310L
Evolution, BIOL 403
General Biology, BIOL 101
Attributes of Living Systems, BIOL 105
Herpetology, BIOL 413/413L
Molecular Genetics, BIOL 425
Pathophysiology, BIOL 241
Principles of Genetics, BIOL 301/301L
Biotechnology, BIOL 396
Senior Thesis, BIOL 483

COLLEGE SERVICE

Academic Policies Committee (Chair)
Library Committee (Chair)
Budget Advisory Task Force
President's Advisory Council
Sigma Xi Secretary
Student Appeals Committee
Biology Club Advisor

Faculty Senate
Higher Learning Commission Steering Committee
Animal Care and Use Committee
Selection committees (several)
Council of Chairs
PreMed Club Advisor

Kyle J. McQuade, Ph.D.

Assistant Professor of Biology
Mesa State College
1100 North Avenue
Grand Junction, CO 81501
970.248.1650
kmcquade@mesastate.edu

Assistant Professor of Biology. Mesa State College. 2006-present

Courses taught

- Attributes of Living Systems – BIOL105
- Cellular Biology – BIOL302
- Methods in Teaching Secondary Science – EDUC497D

Research students mentored

- Everett Austin - 2006 – “Role of heparan-sulfate proteoglycans in keratocyte motility”

TEACHING INTERESTS

- Implementing novel, inquiry-driven experimentation in the teaching laboratory
- Using the primary literature as a teaching tool

RESEARCH INTERESTS

- Regulation of G-protein signaling
- Characterization of the molecular machinery controlling cell motility
- Mechanisms of protein localization

TEACHING EXPERIENCE

present	Postdoctoral Teaching Fellow. Princeton University.	2003-
	Undergraduate Research Mentor, Princeton University.	2004-2005
	Teaching Assistant. University of Wisconsin-Madison.	2001
2001	Undergraduate Research Mentor. University of Wisconsin.	2000-
	Rotation Mentor. University of Wisconsin.	1997-2001
	Volunteer Tutor. Decatur Public Schools.	1995-1996
1996	University Tutor. Millikin University.	1994-
1996	Laboratory Teaching Assistant. Millikin University.	1993-

RESEARCH EXPERIENCE

2006	Post-doctoral Research. Princeton University.	2003-
2003	Doctoral Thesis Research. University of Wisconsin.	1997-
	Undergraduate Thesis Research. University of Wisconsin.	1995-1996
	Undergraduate Research Project. Carnegie Mellon University.	1994

PUBLICATIONS

- McQuade, K. J., Beauvais, D.M., Burbach, B.J. and A. C. Rapraeger. 2006. Syndecan-1 regulates $\alpha_v\beta_5$ integrin activity in B82L fibroblasts. *J. Cell Sci.* **119**: 2445-56.
- McQuade, K. J. and A. C. Rapraeger. 2003. The syndecan-1 transmembrane and extracellular domains have unique and distinct roles in cell spreading. *J. Biol. Chem.* **278**: 46607-15.
- McQuade, K. J. 2003. Roles of syndecan-1 in cell adhesion and signaling. doctoral thesis – University of Wisconsin-Madison.
- Lebakken, C. S., McQuade, K. J. and A. C. Rapraeger. 2000. Syndecan-1 signals independently of β_1 integrins during raji cell spreading. *Exp. Cell Res.* **259**: 315-325.
- Svitkina, T., Verkhovsky, A., McQuade, K. and G. Borisy. 1997. Analysis of the actin-myosin II system in fish epidermal keratocytes: mechanism of cell body translocation. *J. Cell Biol.* **139**: 397-415.

PUBLISHED ABSTRACTS

- McQuade, K. J. and A. C. Rapraeger. 1999. Syndecan-1 mediates filopodial extension in B82L fibroblasts. *Mol. Biol. Cell.* **10s**: 451a.
- Svitkina, T., Verkhovsky, A., McQuade, K. and G. Borisy. 1996. Organization and dynamics of myosin II in locomoting and stationary fish epidermal keratocytes. *Mol. Biol. Cell.* **7s**: 560a.
- Verkhovsky, A., Svitkina, T., McQuade, K. and G. Borisy. 1996. Polarity of fish epidermal keratocytes. *Mol. Biol. Cell.* **7s**: 231a.

POSTER PRESENTATIONS

- Meeting of the American Society for Matrix Biology, Houston, TX. 2002. The syndecan-1 transmembrane domain signals spreading via a mechanism involving lipid rafts.
- Meeting of the American Society for Cell Biology, Washington, D. C. 1999. Syndecan-1 mediates filopodial extension in B82L fibroblasts.

EDUCATION

- University of Wisconsin-Madison, Madison, WI. 2003
- Ph.D. in Cellular and Molecular Biology
- Millikin University, Decatur, IL. 1996
- B.S. in Biology and Chemistry, *magna cum laude*

Denise S. McKenney
912 Ouray
Grand Junction, Colorado 81501
(970) 256-7907
(970) 248-1015

Education: Ph.D in Microbiology. May 1986
North Carolina State University, Raleigh, NC

Secondary Certification in Biology and Chemistry. May 1979.
New Mexico State University, Las Cruces, NM

B.S. in Biology. January 1978
New Mexico State University, Las Cruces, NM

**Professional
Experience:**

Professor. Department of Biological Sciences,
Mesa State College, Grand Junction, Colorado
August 2001-present

Associate Professor. Department of Biological Sciences,
Mesa State College, Grand Junction, Colorado
August 1996-2000

Lecturer. Department of Science and Mathematics,
University of Texas of the Permian Basin, Odessa, Texas
August 1994-May 1996

Assistant Professor. Department of Science and Mathematics,
University of Texas of the Permian Basin, Odessa, Texas
August 1987-August 1994

Research Associate. Department of Food Science,
North Carolina State University, Raleigh, North Carolina
July 1986-July 1987

Graduate Research Assistant. Department of Microbiology,
North Carolina State University, Raleigh, North Carolina
August 1981-May 1986

Instructor. Las Cruces Public Schools, Las Cruces, New Mexico
August 1979-June 1981

- Publications:** McKenney, D. and J. A. Nickel. 1997. Mathematical model for cell division. *Mathematical Computer Modelling*. 25: 49-52.
- Hill, D.A., D.S. McKenney, K.R. Finer and T.R. Klaenhammer. 1989. Localization, cloning and expression of genetic determinants for bacteriophage resistance (Hsp) from the conjugative, phage resistance plasmid pTR2030. *Applied and Environmental Microbiology*. 55: 1684-1689.
- McKenney, D.S. and T. Melton. 1986. Isolation and characterization of ack and pta mutants in Azotobacter vinelandii affecting acetate-glucose diauxie. *Journal of Bacteriology*. 165: 6-12.
- McKenney, D.S. and T. Melton. 1986. Alternations of glucose transport and diauxic growth in 5-thio-D-glucose resistant mutants of Azotobacter vinelandii. *Journal of Bacteriology*. 168: 752-755.

**Published
Abstract:**

Dyer, L.A., W. Williams, and D. McKenney. 1999. Top-down and bottom-up community regulation in alfalfa fields. *Ecological Society of America Annual Meeting*. 84: 80.

**Masters
Theses:**

Allan Lee Roberts. Master of Science May 1989. Isolation and characterization of Azotobacter bacteriophage from West Texas soils.

Vickie Darlene Foster. Master of Science August 1989. Microbial survey of hand sinks in food service establishments in Odessa, Texas.

Sean Kevin Roden. Master of Science August 1990. Investigations of the isolation of the acetate utilization and fluoroacetate resistance genes from Azotobacter vinelandii.

Susan Marie Ray. Master of Science May 1995. Development of an enzyme immunoassay using a monoclonal antibody specific for luteinizing hormone in a variety of mammalian species.

Peggy Allen. Master of Science August 1995. Bench scale evaluation of the impact of alum bearing wastewater on activated sludge treatment.

William David Melvin. Master of Science May 1997. Development of methods for analysis of bioremediation effectiveness in the semi-arid environment of West Texas.

Ethel Matthews. Master of Science May 1997. A study of fungi in the bioremediation of weathered crude oil from a soil in Midland County, Texas.

Pamela Pipes. Master of Science May 1997. The effects of corticosterone on luteinizing hormone and follicle-stimulating hormone subunit gene expression in cultured rat anterior pituitary cells: interactions with estrogen.

**Academic
Awards:**

UTPB Presidential Award for Distinction in Teaching, 1990
Chancellor's Council Outstanding Teaching Award, 1994

Grants:

UTPB Faculty Research Award, 1989. "Isolation and characterization of soil Azotobacter and their bacteriophage." \$5,363.

UTPB Faculty/ Instructional Development, 1993. Attend summer course "Techniques for DNA sequencing and PCR and RFLP analysis." \$1600.

Permian Basin Petroleum Association and the Abel-Hanger Foundation, 1994. "Optimal Conditions for Hydrocarbon Bioremediation". \$51,528.

Lathrop Agricultural Fund, 1998. Lee Dyer, Denise McKenney, Steve Werman, Eric Rechel, Craig Dotson, and Carrie McVean-Waring. \$9,000.

OSC Professional Development Fund. 1998. Purchase of a transilluminator, camera and adjustable pipette. \$1804.

OSC Professional Development Fund. 1999. Purchase of a microcentrifuge and set of adjustable pipettes. \$1800.

**Professional
Memberships:**

American Society for Microbiology
Sigma Xi

References:

Provided upon request

CURRICULUM VITAE

Gary Loren McCallister
Professor of Biology
Mesa State College
1100 North Avenue
Grand Junction, Colorado 81501
Office Phone: 970/248-1939
Home Phone: 970/245-3989
E-Mail: mccallis@mesastate.edu
gmccallister@bresnan.net

BIRTH DATE:

February 26, 1945 Grand Junction, Colorado USA

MARITAL STATUS:

Married, four married children

MAJOR AREAS:

Zoology/Parasitology/Science Education

EDUCATION:

Mesa College	1963-65	English Literature
Brigham Young University	1968-70	Zoology, B.S. minor, English Literature
	1970-72	Parasitology, M.S.
Univ. Of Northern Colorado	1976-82	Biology, Doctor of Arts

CONTINUING EDUCATION:

NSF Short Course. University of Utah	1979	Immunology
International Center for Public Health Research. University of South Carolina	1988	Control of mosquitoes and mosquito-borne diseases
Curry College, Massachusetts	1990	National Laboratory Safety Conference
Clemson University, South Carolina	1991	Nematode Identification Course
American Mosquito Control Assoc., Ft. Mead, FL	1993	Emergency Mosquito Control and Mapping for Aerial Spray

NSF Short Course. Christian Brothers Univ., Memphis, Tenn.	1994	Evolutionary Systems
Logo Symposium. St. Paul, Minn.	1995	Logo Symposium - Artificial Life
Florida Mosquito Control Assoc. Florida St. Univ., Tallahassee, Fl.	1996	Mosquito Systematics
NSF Short Course. Tallahassee, Florida	1997	Who Needs Magnetic Fields, National High Magnetic Field Lab
Stonington Retreat. Stonington, Maine	1997	Logo Symposium - Robotics
Colorado Logo Symposium Mesa State College, Colorado	1997 - 2001	Logo Symposium - Robotics
Mindfest, MIT, Boston	1999	Constructionism and Robotics in education
Studied Jazz Guitar - 8 years	1992 - 2000	Gary Smith Productions Grand Junction, CO
Studied Classical Mandolin - 3 years	2000-2003	Walt Birkedahl studio Grand Junction, CO

MAJOR CONFERENCES:

Metropolitan State College Conference	1989	First Annual Multicultural Education
Eisenhower High Plains Consortium for Math and Science	1993	Math and Science Integrative Conference
Colorado State University	1997	NSF Conference on Integrating the Biological Sciences
Colorado State University	1998	NSF Conference on Core Curriculum Reform

PROFESSIONAL EXPERIENCE:

Staff, Logo Foundation, 1999-Present (www.logo-foundation/about/staff-gm)
 Chairman, Biology Department, 1983-1984, 1986-1990, 1994-1998
 Professor of Biology, 1987-Present
 Associate Professor of Biology, 1978-1987

Mesa State College, Grand Junction, Colorado
 *Project Coordinator, Redlands, 1980-1997
 Mosquito Control District, Grand Junction, Colorado. Summers, 1981-1997
 *Technical Writer, 1981-1982
 Paraho Oil shale Company, Grand Junction, Colorado
 *Medical Technologist, 1980-1981
 Grand Junction Community Hospital, Grand Junction, Colorado
 *Teaching Assistant, Biology, 1976-1978
 University of Northern Colorado, Greeley, Colorado
 Assistant Professor of Biology, 1975-1978
 Mesa College, Grand Junction, Colorado
 Instructor of Biology, 1972-1975
 Mesa College, Grand Junction, Colorado
 *Seminary Instructor, 1974-1976
 LDS Church, Grand Junction, Colorado
 Research Assistant, 1971-1972, NIH Grant to Dr. F. L. Andersen
 Brigham Young University, Provo, Utah - Echinococcus Project
 Teaching Assistant, 1969-1971, Brigham Young University, Provo, Utah

**Concurrent Part-time Positions*

RESEARCH EXPERIENCE: (Not resulting in publications)

Experimental

1. The effect of irrigation on pasture survival of nematodes (under direction of Dr. Ferron Andersen, BYU).
2. The effect of dichlorvos on free-living stages of parasitic nematodes (under direction of Dr. Ferron Andersen, BYU).
3. Effect of temperature on growth of three species of Bacillus (contract research for Dr. Warren Buss, UNC).
4. Field trials of control methods involving biological control of mosquitoes. Field testing of attractants for adult female mosquitoes.
6. Hybridization in Culex sp. in west central Colorado.

Surveys

1. Parasitic nematodes of west central Colorado (report to local Wool Growers Association).
2. Parasitic nematodes of west central Colorado (report. to local Cattlemen's Association).
3. Hydatid disease in southern Utah (under the direction of Dr. Ferron Andersen, BYU).
4. Hydatid disease in west central Colorado (contract research for Dr. Ferron Andersen, BYU).
5. Ectoparasites of fish at the junction of the Colorado and Gunnison rivers.
6. Baseline information on mosquito populations in west central Colorado, continued for 21 years.
7. Varroa invasion of western Colorado bees.
8. Encephalitis surveys in west central Colorado (in cooperation with CDC).

INSTITUTIONAL SERVICE

Presently conducting study on how the Biology Department can best serve public school science teachers in School District 51. Sp 2006

Member: Center for Teaching and Learning, 2001 to 2004

Director and Originator of the Annual Colorado Logo Symposium, 1997 to 2003

Chairman, Science Building Executive Committee for designing and overseeing construction of new science building.

Organizer and Director, Mesa State College Science Team. Developed science fair projects with selected middle school students, summers 1991-94.

College Representative for BSCS-COSTEP in conjunction with School District 51. 1993-1996.

Instructor, Partners in Progress Precollegiate Program for Minorities, Mesa State College, 1989-90.

Chairman, Faculty Development Committee, 1986-1989. Established committee and established an in-house grant program to help faculty with scholarly outside projects.

Elected to Faculty Senate. 1984-1987, 1992-93, temporary appointment fall 2005

Chairman (first) Faculty Awards Committee. 1978-1985. Established award, Liaison Officer to the Office of Federal Programs (AASCU). 1983. Grant training workshop in Washington, D.C.

Member Faculty Salary Committee, 1974-1975, 1978. Helped establish ranking and merit pay.

Chairman, Faculty Salary Committee. 1975.

RESEARCH PUBLICATIONS:

1. McCallister, G. L. 1976. Effect of Haloxon and Thiabendazole on the Free-Living Stages of Haemonchus contortus. Helm. Soc. of Wash. 43:89-80.
2. McCallister, G. L. 1977. Efficiency of the Seinhorst Filter for the Recovery of Eimeria tenella Oocysts, from Feces. Helm. Soc. of Wash. 44:218-219.
3. McCallister, Gary L. 1977. Intestinal Nematode Parasites of Cattle in West Central Colorado. J. of Parasitology, 93(3):527.
4. McCallister, G. L. And G. D. Schmidt. 1978. Diurnal Migration of Female

- Thelastoma bulhoesi in the cockroach Periplaneta americana. 53rd Annual Meeting of Amer. Soc. of Parasitologists: Abstract 69.
5. McCallister, G. L. 1980. Teaching Teachers to Teach. J. Of College Science Teaching. 9:211-214.
 6. Sears, B. W., J. C. Herideman and G. L. McCallister. 1980. Dirofilaria immitis in West Central Colorado. J. of Parasitology, 66:1070.
 7. McCallister, G.L. 1980. Soft Drinks as a source of Carbon Dioxide: Use in the Excystation of Coccidian Oocysts. J. of College Science Teaching 9:276-277.
 8. McCallister, G. L. And G. D. Schmidt. 1981. Diurnal Migration of Female Thelastoma bulhoesi in the cockroach Periplaneta americana. Helm Soc. of Wash. 48(2):127-129.
 9. McCallister, G. L. 1981. The Biology of Thelastoma bulhoesi, a nematode parasite of cockroaches. Dissertation, University of Northern Colorado, Greeley.
 10. McCallister, G. L. and G. D. Schmidt. 1983. Development of Thelastoma bulhoesi (Oxyurata: Thelastomatida) and the Effect of Thiabendazole on the Unembryonated Egg. J. of Nematology, Vol. 15, No. 2.
 11. McCallister, G. L. And G. Eastham. 1984. The Turbatrix t test. Carolina Tips. 47(7).
 12. Maleki, Mitra and G. L., McCallister. 1984. Incidence of the leech Helobdella stagnalis on the Colorado River in west central Colorado. Great Basin Naturalist. 44(2):361-362.
 13. McCallister, G. L. And G. D. Schmidt. 1984. The effect of temperature on the development of Thelastoma bulhoesi (Oxyurata, Thelastomatida) and other nematodes. J. of Nematology. 16(4):355-360.
 14. Orr, Thomas and G. L. McCallister. 1987. American swallow bug, Oeciacus vicarius Horvath (Hemiptera: Cimicidae), in Hirundo rustica and Petrochelidon pyrrhonota nests in west-central Colorado. Great Basin Naturalist 47(2).
 15. McCallister, G. L. 1988. The Effect of Thelastoma bulhoesi and Hammerschmidtella diesing: on host size and physiology in Periplaneta americana. Helm. Soc. Wash. 55(1):12-14.
 16. Diers. J. And G.L. McCallister. 1989. Incidence of Cryptosporidium in

- day-care children in west central Colorado. *J. of Parasitology*. 75(4):637-638.
17. McCallister, G. L. 1989. The Roles of the Laboratory in Teaching College Level Science. *J. of the Colo. Wyo. Acad. of Sci.* 21:19.
18. McCallister, G. L. 1992. The use of degree days to predict Culex populations in the field. *J. of the Amer. Mosq. Control Assoc.* 8(1):63-66.
19. McCallister, G. L. 1993. The effect of temperature, pH, sodium chloride, and glucose on the survival of female Thelastoma bulhoesi (Nematoda: Oxyurata). *Helm. Soc. of Wash.* 60(2): 170-173.
20. McCallister, Z. G. and G. L. McCallister. 1996. Quantitative Phagocytosis. *The American Biology Teacher* 58(6):348-351.
21. Peterson, Rick; Tara McCallister, Bill Tiernan and Gary McCallister, 1998. Collecting Micrometeorites in Collaboration with Middle School Students. *Proceeding of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science* 38 (1):50.
22. McCallister, Gary L. 1998. Life as Information Processing: a biologist's point of view. *Proceedings of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science* 38(1):51.
23. McCallister, Gary L. 1998. The Origins of Disease. *Proceedings of the Rocky Mountain Conference of Parasitologists* 29: 4-7.
24. McCallister, Gary L. 1998. The Response of Adult Female Mosquitoes (*Aedes* and *Culex*) to Several Types of Floral Attractants Over the Course of the Breeding Season in West-Central Colorado. *Proceedings of the Rocky Mountain Conference of Parasitologists* 29:7-8.
25. McCallister, Zane G. and Gary McCallister. 1998. Can *Culex* Numbers Serve as an early Warning for Encephalitis Outbreaks? *Proceedings of the Rocky Mountain Conference of Parasitologists* 29:8-9.
26. McCallister, G.L. 1999. A computer model of host seeking behaviors. *Proceedings of the 52nd Annual Meeting of the Utah Mosquito Abatement Association.*
27. McCallister, G.L., Gary Mullens and Zane McCallister. 1999. Acarine parasites of mosquitoes in west-central Colorado. *Proceedings of the 52nd Annual Meeting of the Utah Mosquito Abatement Association.*

28. McCallister, G.L. and Brett DeGooyer. 1999. The effect of a photodynamic dye, Rose Bengal, and light on first stage larvae of *Culex tarsalis*. Proceedings of the 52nd Annual Meeting of the Utah Mosquito Abatement Association.
29. Heckmann, Richard, and Gary McCallister. 2001. The Fine Structure and Attachment of Acarine Parasites on Mosquitos in West Central Colorado. Proceedings of the Annual Conference of the Utah Academy of Sciences, Arts & Letters.
30. McCallister, G. L. 2002. Guest Editorial: A Proposal to Improve Science Education in the Public Schools. *The American Biology Teacher* 64:247-248.
31. McCallister, G. L. 2004. Emerging Problems in Parasitology in North America. Proceedings of the Annual Conference of the Utah Academy of Sciences, Arts & Letters.
32. McCallister, G. L. 2005. DNA as Binary Code. *Journal of College Science Teaching* 34(5):34-37.

PUBLICATIONS:

1. McCallister, G. L. 1974. *Play Gypsy Play*. Clover Collection of Verse.
2. McCallister, G. L. 1975. *Wasted*. Clover Collection of Verse.
3. McCallister, G. L. 1980. Root Dip Boosts Yields. In Reader's Forum *Organic Gardening*, April, p. 22.
4. McCallister, G. L. 1981. *Thirty-Five*. In the World 's Great Contemporary Poems.
5. McCallister, G. L. 1982. To *Thelastoma bulhoesi*: Upon Completion of my Doctoral Dissertation. In *Para-Poems*. C. Arme and S. Richards, eds. University of Keele, Staffordshire, England.
6. McCallister, G. L. 1982. Notes on the Woods Cross Exit. In the *Mesa College Literary Review*, 1981-82. P. 14-15.
7. McCallister, G. L. 1983. Book review of *The Invertebrate World* by R. H. Barth and R. E. Broshears. In *J. Of College Sci. Teaching* 13(5):452.
8. McCallister, G. L. 1984. A Technical Analysis: doing Battle with *Culex tarsalis*. *Outlook Magazine*. Fall.
9. McCallister, G. L. How to diagnose your own livestock for intestinal parasites. *Mother Earth News*, Fall 1984.
10. McCallister, G. L. What's the Difference? *Outlook Magazine*. Winter 1985.
11. McCallister, G. L. 1985. *Song of Rescue* (short story), *Ensign*, July.

12. McCallister, G. L. 1985. Book Review of Science and Religion in the Nineteenth Century by Tess Cosslett, ed. In J. of College Science Teaching 15(2): 425-144.
13. McCallister, G. L. 1985. A review of the Features section of the Journal of College Science Teaching, 1984-1985 in Report on the Journal of College Science Teaching, 1985. Edited by Jack L. Carter, JCST Advisory Board.
14. McCallister, G. L. 1986. Would you like to see a nematode? Challenge 4(4) Iss. 19: 35-36.
15. McCallister, G. L. 1986. Editorial: The role of the laboratory in teaching parasitology. ASP Newsletter 8(1): 7-8.
16. McCallister, G. L. 1988. Book review of "The Light Microscope: Principles and practice for Biologists" by Ernst Fallenbach. Journal of College Science Teaching 17:303.
17. McCallister, G. L. 1988. The Shot (poetry) Goal Post Scripts 7(1):9.
18. McCallister, G. L. 1988. Rx for Mental Block - Take a Walk. Walkways 4(1):3.
19. McCallister, G. L. 1989. Our Thanksgiving Cow (short story). The Friend (Nov.) 19:2-5.
20. Van Orden, LaVonne, ed. 1989. Blessed by the Hymns. Chapter 14: Song of Rescue, Deseret Books, Salt Lake City, Utah.
21. McCallister, G. L. 1991. I Hate That (short story) in The New Era.
22. McCallister, G. L. 1992. Three poems: An Afternoon, Dan at 16, Daniel's Monolith. Zarahemla 1(4):5-6.
23. McCallister, G. L. 1994. Taking exception to Jeremy Bernstein. Letter to the editor in J. of College Science Teaching. 23:199.
24. McCallister, G. L. 1996. Logo As Science. ...lcs.www.media.mit.edu/groups/logofoundation/profdev/happycamper.html.
25. McCallister, G.L. 1999. The Kindergarten Model of Education Logo Update. Vol. 7 Fall.
26. McCallister, G.L. 1999. In the Beginning. Mandolin Quarterly. 4(4) Dec.
27. McCallister, G.L. 2001. The Duo Capriccioso: up close and personal. The Mandolin Journal. XV(3):10-11.

28. McCallister, G.L. 2002. Mandointrospection: The Flaming Moth Studio. The Mandolin Quarterly 16(1): 17-18.
29. McCallister, G.L. 2002. The Flaming Moth Studio: Lesson 1 & 2. The Mandolin Quarterly. 16(2): 19 and 29.
30. McCallister, G.L. 2002. The Flaming Moth Studio: Lesson 4&5. The Mandolin Quarterly. 16(4): 3 and 10.
31. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 6&7. The Mandolin Quarterly. 17(1): 11.
32. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 8&9. The Mandolin Quarterly. 17(2): 8
33. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 10&11. The Mandolin Quarterly. 17(3): 10,11
34. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 12&13. The Mandolin Quarterly. 17(4): 10,11
35. McCallister, G.L. 2004. The Flaming Moth Studio: Lesson 14&15. The Mandolin Quarterly. 18(1): 10
36. McCallister, G.L. 2004. The Flaming Moth Studio: Lesson 16&17. The Mandolin Quarterly. 18(2): 11
37. McCallister, G.L. 2004. The Flaming Moth Studio: Lesson 18&19. The Mandolin Quarterly. 18(3): 10,11
38. McCallister, G.L. 2005. The Flaming Moth Studio: Lesson 20&21. The Mandolin Quarterly. 19(1): 10,11
39. McCallister, G.L. 2005. The Flaming Moth Studio: Lesson 22&23. The Mandolin Quarterly. 19(2): 10,11
40. McCallister, G.L. 2005. The Flaming Moth Studio: Lesson 24&25. The Mandolin Quarterly. 17(3): 10,11

SOFTWARE AND DIGITAL PRODUCTIONS DEVELOPED:

Mosquito Host Seeking Behavior Model, 1998

Fundamentals of Teaching, released January 2004

Communicator Award 2004 - International Award for Digital communication
media, Education Division

Mormon Blues, music CD, by The One Man Mormon Blues Band, commercial release Sept. 2005.

GRANT PROPOSALS FUNDED:

1. Colorado Consortium of State Colleges. Plan and host the Rocky Mountain Conference of Parasitologist. 1983. (\$1,000.00)
2. Colorado Consortium of State College. Travel funds to attend national meetings of the American Society of Parasitology. 1984. (\$500.00)
3. Colorado Consortium of State Colleges. Travel funds to attend national meeting of the American Society of Parasitologist and the American Association of Tropical Medicine and Hygiene. (\$500.00)
4. Colorado Consortium of State Colleges (with Phyllis Chowdry). Feasibility of acquisition of human cadavers. 1986-87. (\$700.00)
5. Colorado Consortium of State College (with Rick Ballard). Feasibility study and planning for greenhouse construction. 1987-88. (\$500.00)
6. Colorado Consortium of State Colleges (with Ed Hurlbut). Identification of, and visit to, three colleges with excellent reputations to study programs and compare them to Mesa State College. \$500.00)
7. Mesa County, Colorado. Develop and implement a mosquito control program for Mesa County in response to a 1985 St. Louis Encephalitis outbreak. This was a cooperative effort, with Mesa State College providing personnel and laboratory space and equipment and Mesa County providing funds and Vehicles. 1986 (\$35,000.00) 1987 (\$25,000.00) 1988 (\$25,000.00)
8. Redlands Mosquito Control District. Attend a one week course on Control of Mosquitoes and Mosquito Borne Diseases sponsored by the International Center for Public Health Research (Univ. Of S. Caroline). 1988. (\$1200.00)
9. Mesa State College Faculty Development. Attend national meetings of the American Mosquito Control Association to participate on national committees. 1992, 1993 (\$2000.00)
10. Mesa State College Faculty Development. Attend the NSF course on Evolutionary Systems, Christian Brothers Univ., Memphis, Tennessee . 1994. (\$1500.00)
11. Mesa State College Alumni. Dixson Mentor/Scholar Award. 1994-95. Nematode parasites of Iguana (\$2000.00)
12. El Pomar Foundation. Purchase of Robotics Kit for course development. 1996. (\$700.00)

13. Mesa State College Technology Grant. Purchase robotic equipment and software. Travel funds to visit MIT. 1996. (\$1500.00)
14. Mesa State College Alumni. Dixson Mentor/Scholar Award. Distribution of Aedes ova during winter months. 1997-98. (\$2000.00)
15. MSC Professional Development. Provide classroom technology training for local teachers. 1998. (\$12,000.00)
16. MSC Professional Development. With Warren MacEvoy and Jim Rybak. Provide technology and robotic training for local teachers. 1999. (\$20,000.00)

COURSES TAUGHT (and # of times taught):

<u>Organismal</u>	<u>Medically Related</u>	<u>Miscellaneous</u>
Parasitology (27)	Anatomy and Physiology (24)	General Biology - non majors (5)
Invertebrate Zoology (15)	Immunology (10)	General Biology - majors (5)
General Zoology (10)	Cell Biology (3)	Methods of Teaching Science -
Microbiology (25)	Histology (3)	Graduate Level (2)
Entomology (5)	Epidemiology (12)	Undergraduate (15)
		Technobiology (3)

PROFESSIONAL SOCIETIES, ACTIVITIES, AND HONORS:

Honors

- Music CD Nominated for Pearl Awards in 5 categories (2006)
- Male Recording Artist, New Recording Artist, Contemporary Album, Cover Design, and Songwriter. - Awards ceremony to be held in June
- Invited Speaker - BYU Education Week 2004 (substitute), 2005 (substitute), 2006 (full appointment)
- Communicator Award (2004)
- Appointed Board of Directors, Revolutionary Sciences, Inc. (2003- to present)
- Elected member Sigma Xi (1978)
- Dixson Mentor/Scholar (1996, 1998)
- Received Boettcher Fellowship (1977-78)
- President-Rocky Mountain Conference of Parasitologists (RMCP) (1982-83) (1995-96)
- Distinguished Faculty Award (1988)

Activities

- Founder, CEO, Flaming Moth Productions (2003)
- Program Chairman - RMCP (1983, 1998)
- Member Center for Teaching and Learning (1998 - 2004)

Societies

- Member - American Society of Parasitologists - 1970 - present
- Rocky Mountain Conference of Parasitologists 1970 - present
- National Science Teachers Association (Editorial Review Board, 1992-1995)
- Helminthological Society of Washington 1970 - present
- American Biology Teachers 1975 - present

American Mosquito Control Association 1982- present
Member - Training Committee, 1991-1994
Publication Committee, 1991-1994
Editorial Board, 2001
Entomology Society of America, 1996 - 2005
The Society of Nematologists, 1971 - present
International Society for Technology in Education, 1991- present

COMMUNITY SERVICE:

Redlands Mosquito Control District Governing Board, 2001 to 2004
Grand Valley Mosquito Control Task Force (1998-2003)
Member School Board, Colorado School District 51. 1993-1995
School District Accountability Committee. 1992-93.
Advisory Board. Tri-River Extension Agency. 1980-1983.
Scoutmaster. Boy Scouts of America. 1986-1990.
Church of Jesus Christ of Latter Day Saints - presently serving as Bishop 2003 - present
Soccer Coach 10-year old league, 1985 to 1989.

BUSINESS EXPERIENCE:

Flaming Moth Production Company 2003 - present
Board of Directors Revolutionary Science 2000 - present
Consultant in Mosquito Control - 1982 - present
Beekeeper 1982 - 86
Real Estate Sales 1974 - 78
Fuller Brush sales 1973 - 1974

REFERENCES:

Mr. Michael Temple: President, Logo Foundation
250 W. 85th Street
New York, NY 10024
michaelt@media.mit.edu

Robert E. Kribel: retired Dean, MSC
674 Ogletree Road
Auburn, AL 36830
Home (334) 821-9075
Cell (334) 329-0512
bkribel@charter.net

Dr. Christian Buys: Professor of Psychology
Mesa State College
Grand Junction, Colorado 81501
(970) 248-1764
cbuys@mesastate.edu

(more references on next page)

Dr. Denise McKenney: Chairman, Biology Department
Mesa State College
1100 North Ave.
Grand Junction, CO 81502
(970)248-1909
dmckenne@mesastate.edu

Dr. Richard Heckmann: Professor of Zoology (retired)
Brigham Young University
Provo, Utah 84601
(801)225-7482
richard_heckmann@byu.edu

Dr. Ferron Andersen: Professor of Zoology (retired)
Zoology Department
Brigham Young University
Provo, Utah 84601
(801) 225-7482

CURRICULUM VITAE/BIOGRAPHICAL SKETCH

Margot Caley Beckett, Ph.D.
Department of Biological Sciences
Mesa State College
Grand Junction, Colorado 81501

Work Phone: (970) 248-1892
Home Phone: (970) 778-0135
Fax: (970) 248- 1700
E-mail: mbecktel@mesastate.edu

EDUCATION:

1999 – 2004: Cornell University, Ithaca, NY 14853

Department of Plant Pathology

Ph.D. Major: Plant Pathology

Major Advisor: Dr. William E. Fry

Minors: Plant Physiology and Horticulture

Minor Advisors: Dr. Thomas G. Owens and Dr. Thomas C. Weiler, respectively

Area of Research: Late blight of *Petunia x hybrida*, *Calibrachoa x hybridus* and *Nicotiana benthamiana*

Completed Ph.D. November, 2004; Conferred January, 2004.

1993 – 1998: Mesa State College, Grand Junction, CO 81501

B.S. Biology

Chemistry Minor

Advisor: Dr. Walter Kelley

Graduated Magna cum laude

EXPERIENCE

Spring 2005 - Present: Lecturer of Biology

Department of Biology, Mesa State College

Classes taught:

BIOL 101, 101L General Human Biology Lecture and Lab

BIOL 450, 450L Mycology Lecture and Lab

BIOL 107, 107L Principals of Plant Biology Lecture and Lab

1999 – 2004: Graduate Research Assistant; Ph.D. Candidate

Department of Plant Pathology, Cornell University

Research Advisor: Dr. William E. Fry

2001: Graduate teaching assistant for Dr. Bill Fry

Department of Plant Pathology, Cornell University

Plant Pathology 241 Plant diseases and disease management Lab

1998: Undergraduate Research Assistant

La Selva Biological Research Station, Costa Rica

Projects: 1) Ecological investigation of the relationships between several species of tropical plants, herbivores, predators and parasitoids. 2) A study of the trophic cascade involving ants and “ant-plants” in the *Piperaceae* family.

Research Advisors: Dr. Lee Dyer and Dr. Grant Gentry

1998: Undergraduate Research Assistant

Chemistry Department, Mesa State College, Grand Junction, CO

Project: Chemical analysis of putative insect deterrent alkaloids present in several *Solanum spp.*

Research Advisors: Dr. Lee Dyer and Dr. Craig Dodson

1997: Student Greenhouse Manager

Biology Department, Mesa State College, Grand Junction, CO

Supervisor: Dr. Walter Kelley

1997: Volunteer

Colorado State University Extension Office, Plant Diagnostic Clinic, Grand Junction, CO

Supervisor: Dr. Curt Swift

REPRESENTATIVE PRESENTATIONS AND POSTERS:

2003: Poster presented to the American Floral Endowment at the Long Island Horticultural Research and Extension Center and the 2003 "Cornell Floriculture Open House and Field Day" entitled "Petunia late blight a Typhoid Mary?"

2003: Presentation at the annual meeting of the American Phytopathological Society entitled "Temperature and moisture requirements for establishment, incubation period, latent period and sporulation of *Phytophthora infestans* on petunia."

2003: Presentation at the Ohio Florists' Association Short Course entitled "Late blight – beware the petunias".

2001: Presentation at the annual meeting of the Northeast Division of the American Phytopathological Society entitled "Isolates of *Phytophthora infestans* that infect *Petunia x hybrida* and *Nicotiana benthamiana* also produce INF1."

PROFESSIONAL COMMITTEES AND ACTIVITIES:

2004: APS Early Career Professionals Committee

2003: APS Placement Committee

2003: APS Young Professionals Ad Hoc Committee

2002: Plant Pathology Seminar Committee, Cornell University

2001-2003: New Student Coordinating Committee, Cornell University

2001: Secretary, Cornell Plant Pathology Graduate Student Association

2000: Co-Chair, Cornell Plant Pathology Graduate Student Association

2000: Chair, Cornell Plant Pathology Graduate Student Colloquium

1995-1997: Vice President, Epsilon Omicron Chapter, Tri-Beta Biological Honor Society

SOCIETIES:

2005: American Horticultural Society

2005 – Present: Sigma Xi

1998 – Present: American Phytopathological Society

1993 – Present: Tri-Beta Biological Honor Society

HONORS AND AWARDS:

2003: Travel Grant, Cornell University, Ithaca, NY

2003: Research Grant from The Fred C. Gloeckner Foundation, Inc.

2003: APS Foundation Student Travel Award

2002: Research Grant from The Fred C. Gloeckner Foundation, Inc.

2001: Travel Grant, Cornell University, Ithaca, NY

2001: Outstanding Teaching Assistant Award, Cornell University, Ithaca, NY

1999 – 2004: Graduate Research Assistantship, Dept. of Plant Pathology, Cornell University, Ithaca, NY

1994, 1997: President's Scholar, Mesa State College, Grand Junction, CO

1995: Scholarship from the American Association of University Women – Amy Lutz Rechel Scholarship.

1993, 96, 97, and 98: Dean's List, Mesa State College, Grand Junction, CO

1993 – 1998: Academic Scholarship, Mesa State College, Grand Junction, CO

PUBLICATIONS

PEER REVIEWED PAPERS:

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. (2005). Epidemiology and Management of Petunia and Tomato Late Blight in the Greenhouse. *Plant Disease* 89: 1000-1008.

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. (2005). Temperature and Leaf Wetness Requirements for Pathogen Establishment, Incubation Period and Sporulation of *Phytophthora infestans* on *Petunia x hybrida*. *Plant Disease* 89: 975-979.

Becktell, M. C., Smart, C. D., Haney, C. H. and Fry, W. E. (2006). Host-Pathogen Interactions Between *Phytophthora infestans* and the Solanaceous Hosts *Calibrachoa x hybridus*, *Petunia x hybrida* and *Nicotiana benthamiana*. *Plant Disease* 90: 24-32

Bruckart, III, W. L., Eskandary, F. M., Becktell, M. C., Bean, D. (2006). *Puccinia acroptili* on Russian knapweed in Colorado, Montana, and Wyoming. *Plant Dis.* 90:971.

TRADE JOURNAL ARTICLES:

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. (2003). Beware of Late Blight on Petunias and Tomatoes. *Greenhouse Business*. June 2003: 31-32

Daughtrey, M. and Becktell, M. (2002) Scary *Phytophthoras*. *Grower Talks*. September 2002: 90, 92.

PUBLISHED ABSTRACTS:

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. (2003). Temperature and moisture requirements for establishment, incubation period, latent period and sporulation of *Phytophthora infestans* on petunia. *Phytopathology* 93(6):S7.

Rathbone*, M.C., Smart, C. D and Fry, W. E. (2001) Isolates of *Phytophthora infestans* that infect *Petunia hybrida* and *Nicotiana benthamiana* also produce INF1. *Phytopathology* 92(6): S145.

* Maiden name

EXTENSION PUBLICATIONS:

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. (2002) Petunia late blight, an emerging disease? Focus on Floriculture, Cornell University. Volume 1, No. 2

VITA

Name: Phyllis Chowdry

Address: Box 709
New Castle, Colorado 81647

Employment History: **1976-2006**
Professor of Biological Sciences
Mesa State College
Grand Junction, Colorado 81501

1969-1975
Instructor of Biology/Chemistry
Colorado Northwest Community College
Rangely, Colorado

1968-1969
Secondary School Teacher
DeBeque Middle/High School
DeBeque, Colorado

1961-1967
Secondary Science Teacher
Byers Junior High School
Denver, Colorado

1959-1960
Medical Technologist-part time
St. Anthony's Hospital
Mercy Hospital
Denver, Colorado

1957-1959
Research Technician
Veteran's Administration Hospital
Biochemistry & Radioisotopes Research Unit
Denver, Colorado

Work Experience:

My first full time job after earning a Bachelor of Science degree was as a research technician at the Biochemistry and Radioisotopes Research Unit at Veteran's Hospital in Denver. I spent 27 months there and worked under the supervision of a PhD. Biochemist whose name was Alfred Staub. We worked on two main projects while I was there; one was an effort to determine the structure of glucagon and the other was to isolate growth hormone from fresh human placentae. The work involved a lot of overtime without pay and weekends as well. I went back to school to earn 30 hours of required courses in order to obtain a teaching certificate. It was during this time that I supported myself by working as a medical technologist at two different Denver hospitals and by working in a doctor's office as well.

My first teaching position was in a junior high school in Denver where I taught science in grades 7-9 for almost six years. I took time off to go to Arizona State University to earn a master's degree. When I returned to Colorado I taught for one year at DeBeque, Colorado. I was the science teacher for grades 7-12 and taught seventh grade math, general science, earth science, and chemistry that year. I spent the next six years in Rangely at Colorado Northwestern Community College. At first I was the only one in Biology/Chemistry, but later a second individual was hired to help out in Biology. The workload was remarkable. I had no lab assistants and no secretarial support and taught different courses every semester. I again took time off to work on a doctorate and, before it was completed, I was invited to come to Mesa College in 1976.

EDUCATION: **B.S. 1957**
 Certificate in Medical Technology
 M.T. (A.S.C.P.)
 University of Denver
 Denver, Colorado

Additional Course Work 1959-1960
24 hours University of Colorado
Boulder, Colorado

Additional Course Work NSF summer 1961
8 hours Los Angeles State College
Los Angeles, California

Masters Natural Sciences 1968
Arizona State University
Tempe, Arizona

Additional Course Work 1969; 1970

University of Colorado

Embryology

Chemical Microscopy

Plant Physiology

University of Denver

Cell Biology

Flora of Colorado

Seminar

Audio Tutorial Teaching in Biology

Doctor of Arts 1981

University of Northern Colorado

Greeley, Colorado

TEACHING

EXPERIENCE:

College Level Teaching

Colorado Northwestern Community College

General Biology

Botany

Zoology

Introductory Chemistry

General Chemistry

Biochemistry

Cell Biology

Developmental Biology

Ecology

Microbiology

My involvement with a Biology Consortium brought in about \$10,000 worth of equipment to CNCC during my stay there.

Mesa State College

Anatomy & Physiology

Microbiology

Developmental Biology

Pharmacology

Pathophysiology

Biochemistry

Seminars

Special Topics

Genetic Counseling

Nobel Prize Winners

General Physiology

Laboratory Techniques

General Biology Lab

Genetics Lab

Introduction to Human Biology

Attributes of Living Systems

Lecture/lab

**PROFESSIONAL
GROWTH AND**

ACTIVITIES:

- 1978** Passed oral and written exams for doctoral degree
- 1981** Attended Chautauqua short courses in November 1980 and March 1981;
Course: Mechanism of Drug Action
- 1981** Completion and defense of dissertation
Research problem was in the area of biochemical genetics.
“Cyclic AMP Levels in Restricted Mutant and Normal Rat Embryos”
The investigation relates cyclic AMP levels to cell division and the influence of a mutant gene in rats.
- 1981 Promoted from Assistant Professor to Associate Professor.**
- 1980** Guest speaker during the capping ceremonies for graduating
1982 nurses
- 1981** Wrote research proposal for Dr. Rice entitled “Identification of Frost Injury Inducing Bacteria on Fruit Trees in Colorado”
This proposal was submitted in 1982 to CCHE, but was not approved for funding.
- 1982** Attended Pre-Med Days at the University of Colorado Medical School
- 1982-1984**
Chairman, Salary Committee
- 1984** Attended AAAS and Biology Consortium meeting
- 1984-1985**
In March 1984 I was elected as Mesa College’s representative to serve as faculty trustee on the Board of Trustees for the year 1984-85

1985 I attended a workshop/conference sponsored by the Association for Biology Lab Editors

University of Nevada, Las Vegas

Workshop Titles:

Use of Crustaceans to Illustrate Principles of the Control of Ventilation, Acid-Base Physiology

Yeast Genetics

SDS Gel Electrophoresis

Microcomputers in the Student Lab

Human Genetics

1985-1986

CFAC Representative

Member of Executive Committee

1985 Member of Planning Task Force
1986

1985 I served on a committee that was planning a new four year BSN program in the Nursing Department.

1985 I taught Pathophysiology as an outreach course in
1986 Glenwood Springs.

1987 I visited Brigham Young University in Provo and Pike's Peak Community College in Colorado Springs to look at their programs in anatomy and their use of prosection of cadavers.

1987 Promoted to Professor.

1990 Nominated by students for the Distinguished Faculty award. I did not receive the award.

1991 Sabbatical leave to write a textbook

1992-1995

Chair of the Biology Department

1993 Published a pathophysiology textbook:
Pathophysiology with Practical Applications Wm C. Brown, publisher

- 1994** I received the Distinguished Faculty Award.
- 1994** I did some work for Wm. C. Brown publishers. I selected Slice of Life images (laser disk) to be referenced in the Benson Anatomy & Physiology lab manual.
- I wrote several special boxes of information to be included in the Sylvia Mader book Biology: Inquiry into Life.
- 1995** NSF Chautauqua Short Course: Principles of Modern Immunology
- 1995** Member of Professional Development Committee
- 1996** Attended a course in polarizing light microscopy for one week at McCrone Research Institute in Chicago
- 1996** I wrote a National Science Foundation grant proposal requesting funds for the purchase of polarizing light microscopes. The proposal, which was not funded, was entitled "Development of an Interdisciplinary Program in Polarized Light Microscopy".
- 1997** Member of the following committees:
Professional Development and Academic Enrichment
Graduate Degree Steering Committee
Graduate Degree Curriculum Committee
Scholarship Committee, Chair
- 1997** Human Anatomy & Physiology Society conference
Toronto, Canada
- 1997** Training sessions in Power Point
- 1998** Member of the following committees
Graduate Degree Steering Committee
Graduate Degree Curriculum Committee
Scholarship Committee, Chair
- 1998** Co-sponsor of the Biology Club/Tri Beta
- 1998** Member of Dean Search Committee
Member of Search Committee to fill Cell Biology
Position

- 1998** I submitted a proposal for a professional development grant for the purchase of a Nikon Optiphot Pol polarizing light microscope.
- 1999** Scholarship Committee, Chair
Co-Sponsor Biology Club/Tri Beta
Member of Dean Search Committee
Tenure Committee
- 1999** I helped with the planning and coordination of the Tri-Beta conference at Mesa State College during the spring of 1999.
- 1999** I attended Training sessions for scanning pictures and transfer of JPEG files to Power Point.
- 1999** I attended a Human Anatomy & Physiology Conference at Towson University in Baltimore.
- 1999** I attended McCrone Research Institute from March 15-19 for additional training in Applied Polarized Light Microscopy. This involved a week of 8 hour classes with half of each day dedicated to lecture/theory and the other half of the day involving lab experience. I was the only individual representing a college. All other participants were working in either forensics or industry.
- 2000** **Service/Professional Activities**
Scholarship Committee, Chair
Co-Sponsor Biology Club/Tri Beta
Member of Promotion Committee
Member of Tenure Committee
Attended Tri-Beta meetings at Adams State College.
- 2001** **Service/Professional Activities**
Scholarship Committee
Co-Sponsor Biology Club/Tri Beta
Member of Promotion Committee
Attended Tri-Beta meetings at Trinidad Junior College
Attended Human Anatomy & Physiology Society conference for five days; Maui

2002

Service/Professional Activities

Scholarship Committee

Co-Sponsor Biology Club/Tri Beta

Member of Promotion Committee

Member of Tenure Committee

Attended Tri-Beta meetings at Western State

Attended Human Anatomy & Physiology Society
conference for five days at Phoenix, Arizona

2003-2006

Continue to serve on the Scholarship Committee
and to co-sponsor Biology Club/TriBeta

SUMMARY OF PROFESSIONAL ACTIVITIES:

Two Chautauqua short courses: Mechanisms of Drug Action

Workshop sponsored by the Association for Biology Lab Editors

Chautauqua short course: Principles of Modern Immunology

Two full week courses in Polarizing Light Microscopy at
McCrone Research Institute

Human Anatomy & Physiology Society conferences

San Diego

Portsmouth, New Hampshire

Beaumont, Texas

Toronto

St. Louis, Missouri

Portland Oregon

Baltimore, Maryland

Maui

Phoenix, Arizona

AAAS & Biology consortium meetings

Tri-Beta meetings

Committees/Representative Board of Trustees:

Salary Committee, Chair

Numerous search committees

Faculty trustee on the Board of Trustees

CFAC Representative; member of executive committee

Planning committee for BSN program

Professional Development Committee

Tenure Committee

Promotions Committee

Scholarship Committee

Professional Development and Academic Enrichment Committee

Graduate Degree Steering Committee

Graduate Degree Curriculum Committee

GRANT PROPOSALS:

CCHE research proposal: "Identification of Frost Injury Inducing Bacteria on Fruit Trees in Colorado"

NSF grant proposal requesting funds for the purchase of polarizing light microscopes.
"Development of an Interdisciplinary Program in Polarized Light Microscopy"


Professional development proposal for the purchase of a Nikon Optiphot Pol polarizing light microscope

PUBLICATIONS:

Dissertation: "Cyclic AMP Levels in Restricted Mutant and Normal Rat Embryos"

Textbook: "Pathophysiology with Practical Applications" Wm. C. Brown, publisher

Boxed information for the Sylvia Mader book, "Biology: Inquiry into Life"



Appendix 3: Library Assessment



**Library Program Assessment
John U. Tomlinson Library
Mesa State College**

Date of Assessment: July 2006

Purpose of Assessment: Analysis of Library Resources, Biology Program Assessment

Program under review: Biology—Wildlife/Ecology Emphasis

Program Level/s: Bachelor of Science

Liaison Signature: _____

1. Collection Assessment

a. Reference Support:

The Reference collection contains 46 titles covering Biology generally, 16 covering Natural History, 12 covering Nature Conservation, 17 titles on Ecology, 31 for Botany, 9 for Wildlife and Zoology, and 7 on Microbiology.

b. Monographic Sources

The circulating collection contains 961 titles covering Biology broadly (including research in the field); 348 of these were published after 1990. Specific areas are as follows:

Natural History—424 (134 published after 1990)

Nature Conservation—221 (139 after 1990)

Ecology—948 (337 after 1990)

Botany—1,019 (101 after 1990)

Zoology/Wildlife—1,436 (245 after 1990)

Microbiology—307 (65 after 1990)

Public Aspects of Medicine, Toxicology—65 (22 after 1990)

Pathology—160 (60 after 1990)

Internal Medicine, Chronic and Infectious Diseases—94 (22 after 1990)

Plant Culture—1,213 (141 after 1990)

Biotechnology—18 (11 after 1990)

c. Periodicals

In addition to the 273 periodicals covering Biology generally, the library has access to 23 journal titles devoted to Ecology, 88 for Botany, 24 for Organic Chemistry, 57 for Natural History, 15 for Climatology, 26 for Animal Biochemistry, and 151 for Zoology (including 11 for Animal Behavior).

d. Electronic Resources

The Library supports Biology majors with excellent online resources: 6 databases devoted to Biology in addition to the Science Direct database covering science more broadly and the American Chemical Society database covering Biochemistry. Other electronic resources include the online Oxford Dictionary of Biology, the Dictionary of Plant Sciences, Dictionary of Ecology, Oxford Companion to the Earth, Dictionary of Animal Behaviour, and Dictionary of Zoology.

2. Evaluation of the total collection

a. Strengths

Electronic resources for the Biological Sciences provide excellent access to current scholarship in the field. The full text and indexing offered by these databases greatly expand the Library's support of Biology research.

b. Weaknesses

The present print collection is weighted by older materials (77% of materials in specified areas were published before 1990).

3. Recommendations

The purchase of newer titles in this area should continue, and the broad range of electronic resources should be maintained. Weeding of outdated materials by the liaison librarian, in close consultation with faculty, should be considered.

Library Director: _____ Date: _____

**Library Program Assessment
John U. Tomlinson Library
Mesa State College**

Date of Assessment: _____ July 2006 _____

Purpose of Assessment: Analysis of Library Resources, Biology Program Assessment

Program under review: Biology—Pre-Med/Pre-Dental

Program Level/s: Bachelor of Science

Liaison Signature: _____

1. Collection Assessment

a. Reference Support:

Due to the Nursing programs at Mesa State, the reference collection contains extensive resources for Pre-Med Biology students, including 13 titles on human Anatomy, 9 titles addressing Toxicology, 5 on Pathology, and 76 titles covering medicine generally.

b. Monographic Sources

The circulating collection supporting Pre-Med Biology majors is fairly strong; 108 Anatomy titles (77 published after 1990), 466 Physiology titles (314 after 1990), 67 Toxicology titles (45 after 1990), 160 Pathology titles (100 after 1990), and 621 general medicine titles (261 after 1990).

c. Periodicals

The library has access to 270 Biology periodicals with applicability to the Health field in addition to 3,047 Medical journals.

d. Electronic Resources

The Library hosts abundant online resources for the Biological Sciences: 6 databases devoted to Biology in addition to the Science Direct database covering science more broadly.

For health-related Biological Sciences, the databases available are also good: CINAHL, Medline, MicroMedex, Toxline, and PsychInfo. Other electronic resources include Oxford Online reference sources: The Oxford Companion to the Body, The Concise Medical Dictionary, A-Z of Medicinal Drugs, The Oxford Companion to Medicine, Dictionary of Sports Science and Medicine, Dictionary of Nursing, and Dictionary of Psychology.

2. Evaluation of the total collection

a. Strengths

Due to the presence of materials supporting the Nursing Program, Library resources available for Pre-Med Biology majors are fairly extensive. Electronic resources are particularly strong in this area.

b. Weaknesses

The age analysis of the circulating collection of Pre-Med materials revealed a portion of older titles (44% published before 1990) amid the more current materials. In the medical field, where materials older than 5 years are often considered outdated, the age of the collection is of particular concern. Some weeding of dated materials will be needed.

3. Recommendations

The purchase of newer titles in this area should continue, and the broad range of electronic resources should be maintained. Weeding of outdated materials by the liaison librarian, in close consultation with faculty, should be implemented.

Library Director: _____ Date: _____

Library Program Assessment
John U. Tomlinson Library
Mesa State College

Date of Assessment: _____ July 2006 _____

Purpose of Assessment: Analysis of Library Resources, Biology Program Assessment

Program under review: Biology—Research Focus

Program Level/s: Bachelor of Science

Liaison Signature: _____

1. Collection Assessment

a. Reference Support:

The Reference collection contains 46 titles covering Biology, 18 titles covering Microbiology specifically.

b. Monographic Sources

The circulating collection contains 961 titles covering Biology generally (including research in the field); 348 of these were published after 1990. In the area of Microbiology, there are 307 titles, 242 published after 1990. The Library has a small collection of materials on Biotechnology, 18 titles, 7 published in the last 15 years.

c. Periodicals

In addition to the 273 periodicals available covering Biology generally, the Library has access to 22 periodicals in the area of Cytology, 9 covering Cryptograms, 24 for Organic Chemistry, 3 for Experimental Pharmacology, 18 for Neurophysiology, and 5 for Microscopy.

d. Electronic Resources

The Library supports Biology majors at undergraduate and research levels with excellent online resources: 6 databases devoted to Biology in addition to the Science Direct database covering science more broadly and the American Chemical Society database covering Biochemistry. Other electronic resources include the online Oxford Dictionary of Biology and the Dictionary of Plant Sciences.

2. Evaluation of the total collection

a. Strengths

Bolstered by database indexing and full text periodical coverage, Library support is fairly strong for Biology majors interested in research or continuing to graduate school.

b. Weaknesses

The age analysis of the circulating collection of general Biology and Microbiology materials revealed a portion of older titles (54% published before 1990) amid the more current materials. This suggests that some weeding of dated materials may be needed.

3. Recommendations

The purchase of newer titles in this area should continue, and the broad range of electronic resources should be maintained. Weeding of outdated materials by the liaison librarian, in close consultation with faculty, should be considered

Library Director: _____ Date: _____

**Library Program Assessment
John U. Tomlinson Library
Mesa State College**

Date of Assessment: July 2006

Purpose of Assessment: Analysis of Library Resources, Biology Program Assessment

Program under review: Biology—Teacher Certification Concentration

Program Level/s: Bachelor of Science

Liaison Signature: _____

1. Collection Assessment

a. Reference Support:

The reference collection contains 46 reference titles covering Biology and 36 general science reference sources (4 science encyclopedias, 17 science dictionaries, and 15 biographical dictionaries) of potential use for Biology majors with a Concentration in Teacher Certification.

b. Monographic Sources

The circulating collection also supports this group of Biology majors with 1,385 titles covering Natural History and Biology (482 of these published after 1990) and 77 titles specifically geared toward teaching Biology or science in a secondary school classroom.

c. Periodicals

The Library's access to Biology journals includes 273 titles covering Biology generally, 52 titles covering Natural History, and 53 titles covering Science generally. The library also subscribes to Science Teacher, The American Biology Teacher, Science Scope (from the National Science Teachers Association), and School Science and Mathematics.

d. Electronic Resources

Electronic resources include 6 databases devoted to Biology in addition to Science Direct covering the Sciences more generally. Prospective Science Teachers may also find the general academic periodical indexes (Ebsco and Wilson Omnifile) useful, as well as the Education resources available through ERIC. In addition to these online indexes, the online Oxford sources also provide support for general science reference. Titles of possible interest to

Biology majors with a teaching concentration: Science, Technology and Society, the Dictionary of Biology, the Dictionary of Ecology, the Dictionary of Chemistry, the Dictionary of Physics, and the Dictionary of Scientists.

2. Evaluation of the total collection

a. Strengths

The range of print and electronic resources available in both Education and the Biological Sciences offers strong support for Biology majors interested in teaching.

b. Weaknesses

The Biology and Natural History areas of the print collection are weighted with older materials (66% published before 1990). This suggests that some weeding of dated materials may be needed.

3. Recommendations

The purchase of newer titles in this area should continue, and the broad range of electronic resources should be maintained. Weeding of outdated materials by the liaison librarian, in close consultation with faculty, should be considered.

Library Director: _____ Date: _____



Appendix 4: Student Assessment Materials



MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
TOTAL TEST AND SUBSCORES

TEST: BIOLOGY
INSTITUTION: MESA STATE COLLEGE

PAGE: 1 OF 1
REPORT DATE: NOVEMBER 2003

SCALE SCORE	TOTAL TEST		SCALE SCORE	SUBSCORE 1		SUBSCORE 2		SUBSCORE 3		SUBSCORE 4	
	NO. OF STUDENTS	PCT BELOW*		NO. STUD	PCT BELOW*	NO. STUD	PCT BELOW*	NO. STUD	PCT BELOW*	NO. STUD	PCT BELOW*
200	0	100	100	0	100	0	100	0	100	0	100
195-199	0	100	95- 99	0	100	0	100	0	100	0	100
190-194	0	100	90- 94	0	100	0	100	0	100	0	100
185-189	0	100	85- 89	0	100	0	100	0	100	0	100
180-184	0	100	80- 84	0	100	0	100	0	100	0	100
175-179	0	100	75- 79	0	100	0	100	0	100	0	100
170-174	0	100	70- 74	0	100	0	100	0	100	0	100
165-169	0	100	65- 69	0	100	1	83	0	100	0	100
160-164	0	100	60- 64	1	83	1	67	3	50	0	100
155-159	3	50	55- 59	2	50	2	33	0	50	2	67
150-154	0	50	50- 54	2	17	1	17	0	50	1	50
145-149	3	0	45- 49	0	17	1	0	1	33	1	33
140-144	0	0	40- 44	0	17	0	0	1	17	2	0
135-139	0	0	35- 39	1	0	0	0	1	0	0	0
130-134	0	0	30- 34	0	0	0	0	0	0	0	0
125-129	0	0	25- 29	0	0	0	0	0	0	0	0
120-124	0	0	20- 24	0	0	0	0	0	0	0	0

SCALE SCORE MEAN:	152.0	52.8	57.0	52.0	49.5
STANDARD DEV:	5.5	8.6	7.1	11.4	6.9
**SE:	2.24	3.52	2.89	4.65	2.81

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
STUDENTS IN FREQUENCY DISTRIBUTIONS: 6
STUDENTS TESTED: 6

SUBSCORE 1 - CELL BIOLOGY

SUBSCORE 2 - MOLECULAR BIOLOGY & GENETICS

SUBSCORE 3 - ORGANISMAL BIOLOGY

SUBSCORE 4 - POP. BIOLOGY/EVOLUTION/ECOLOGY

* Shows the percent of scores from your institution falling below each scale score range.

**SE=Standard error of the mean based on this department's data.

Subscores and Assessment Indicators for this test cannot be compared to testing years prior to 2000 due to changes in the test that were introduced in 2000. ETS protects the confidentiality of all test data.

ETS MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
ASSESSMENT INDICATORS

TEST: BIOLOGY
INSTITUTION: MESA STATE COLLEGE

PAGE 1 OF 2
REPORT DATE: NOVEMBER 2007

	MEAN PERCENT CORRECT	SE*	00	20	40	60	80	100
ASSESSMENT INDICATOR 1	31.2	6.3	+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 2	64.3	4.5		+-----+	+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 3	49.8	4.2			+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 4	50.0	2.6			+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 5	62.7	9.0			+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 6	42.7	6.4		+-----+	+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 7	46.2	3.2			+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 8	43.5	4.3			+-----+	+-----+	+-----+	+-----+
ASSESSMENT INDICATOR 9	48.7	5.7			+-----+	+-----+	+-----+	+-----+

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
 STUDENTS IN FREQUENCY DISTRIBUTIONS: 6
 STUDENTS TESTED: 6

120 - 200 scale

MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
TOTAL TEST AND SUBSCORES

TEST: BUSINESS
INSTITUTION: MESA STATE COLLEGE

PAGE: 1 OF 1
REPORT DATE: APRIL 2004

TOTAL TEST

SCALE SCORE	NO. OF STUDENTS	PCT BELOW*
200	0	100
195-199	0	100
190-194	2	98
185-189	4	93
180-184	5	88
175-179	4	83
170-174	6	77
165-169	13	62
160-164	8	53
155-159	16	36
150-154	14	20
145-149	11	8
140-144	2	6
135-139	4	1
130-134	0	1
125-129	1	0
120-124	0	0

SCALE SCORE MEAN: 160.7
STANDARD DEV: 13.7
**SE: 1.45

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
STUDENTS IN FREQUENCY DISTRIBUTIONS: 90
STUDENTS TESTED: 90

* Shows the percent of scores from your institution falling below each scale score range.

**SE=Standard error of the mean based on this department's data.

Subscores and Assessment Indicators for this test cannot be compared to testing years prior to 2003 due to changes in the test that were introduced in 2003. ETS protects the confidentiality of all test data.

ETS MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
ASSESSMENT INDICATORS

TEST: BUSINESS
INSTITUTION: MESA STATE COLLEGE

PAGE 1 OF 1
REPORT DATE: APRIL 2004

	MEAN PERCENT CORRECT	SE*	00	20	40	60	80	100
			+-----+-----+-----+-----+					
ASSESSMENT INDICATOR 1	51.8	1.8						
						+-X-+		
ASSESSMENT INDICATOR 2	49.6	1.7						
						+-X-+		
ASSESSMENT INDICATOR 3	68.1	1.4						
							+X+	
ASSESSMENT INDICATOR 4	64.8	1.8						
							+-X-+	
ASSESSMENT INDICATOR 5	42.2	2.1						
					+-X-+			
ASSESSMENT INDICATOR 6	53.6	1.6						
							+-X-+	
ASSESSMENT INDICATOR 7	59.2	1.8						
							+-X-+	
ASSESSMENT INDICATOR 8	52.3	1.9						
							+-X-+	

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
 STUDENTS IN FREQUENCY DISTRIBUTIONS: 90
 STUDENTS TESTED: 90

- ASSESSMENT INDICATORS
- 1: ACCOUNTING
 - 2: ECONOMICS
 - 3: MANAGEMENT
 - 4: QUANTITATIVE BUSINESS ANALYSIS
 - 5: FINANCE
 - 6: MARKETING
 - 7: LEGAL AND SOCIAL ENVIRONMENT
 - 8: INTERNATIONAL ISSUES

Assessment indicator scores are shown as the mean percent correct (X). The dotted lines on each side of the mean (X) represent a confidence band of approximately 95% (plus or minus two standard errors of the mean). See the "Comparative Data Guide" for an explanation of the confidence bands.

Subscores and Assessment Indicators for this test cannot be compared to testing years prior to 2003 due to changes in the test that were introduced in 2003. S protects the confidentiality of all test data.

* SE = Standard error of the mean based on this department's data.

MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
TOTAL TEST AND SUBSCORES

TEST: BIOLOGY
INSTITUTION: MESA STATE COLLEGE

PAGE: 1 OF 1
REPORT DATE: NOVEMBER 2004

SCALE SCORE	TOTAL TEST		SCALE SCORE	SUBSCORE 1		SUBSCORE 2		SUBSCORE 3		SUBSCORE 4	
	NO. OF STUDENTS	PCT BELOW*		NO. STUD	PCT BELOW*	NO. STUD	PCT BELOW*	NO. STUD	PCT BELOW*	NO. STUD	PCT BELOW*
200	0	100	100	0	100	0	100	0	100	0	100
195-199	0	100	95- 99	0	100	0	100	0	100	0	100
190-194	0	100	90- 94	0	100	0	100	0	100	0	100
185-189	0	100	85- 89	0	100	0	100	0	100	0	100
180-184	0	100	80- 84	0	100	0	100	0	100	0	100
175-179	0	100	75- 79	0	100	0	100	0	100	0	100
170-174	0	100	70- 74	1	92	0	100	0	100	1	92
165-169	0	100	65- 69	0	92	1	92	0	100	1	83
160-164	2	83	60- 64	1	83	0	92	0	100	3	58
155-159	1	75	55- 59	0	83	3	67	1	92	1	50
150-154	3	50	50- 54	2	67	1	58	6	42	5	8
145-149	3	25	45- 49	3	42	2	42	4	8	0	8
140-144	2	8	40- 44	2	25	4	8	0	8	0	8
135-139	1	0	35- 39	1	17	1	0	1	0	1	0
130-134	0	0	30- 34	1	8	0	0	0	0	0	0
125-129	0	0	25- 29	1	0	0	0	0	0	0	0
120-124	0	0	20- 24	0	0	0	0	0	0	0	0

SCALE SCORE MEAN:	149.9	46.6	49.1	49.5	56.6
STANDARD DEV:	7.8	12.3	8.9	5.0	9.2
**SE:	2.26	3.56	2.57	1.44	2.64

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
 STUDENTS IN FREQUENCY DISTRIBUTIONS: 12
 STUDENTS TESTED: 12

SUBSCORE 1 - CELL BIOLOGY

SUBSCORE 2 - MOLECULAR BIOLOGY & GENETICS

SUBSCORE 3 - ORGANISMAL BIOLOGY

SUBSCORE 4 - POP. BIOLOGY/EVOLUTION/ECOLOGY

* Shows the percent of scores from your institution falling below each scale score range.

**SE=Standard error of the mean based on this department's data.

Subscores and Assessment Indicators for this test cannot be compared to testing years prior to 2000 due to changes in the test that were introduced in 2000.

ETS protects the confidentiality of all test data.

ETS MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
ASSESSMENT INDICATORS

EST: BIOLOGY
INSTITUTION: MESA STATE COLLEGE

PAGE 1 OF 2
REPORT DATE: NOVEMBER 2004

	MEAN PERCENT CORRECT	SE*	00	20	40	60	80	100	
ASSESSMENT INDICATOR 1	32.2	4.4	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 2	49.9	5.2	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 3	42.5	3.4	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 4	46.5	3.2	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 5	58.5	3.5	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 6	45.0	3.7	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 7	51.4	3.7	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 8	54.8	3.0	+-----+-----+-----+-----+						
					+---X---				
ASSESSMENT INDICATOR 9	44.5	3.0	+-----+-----+-----+-----+						
					+---X---				

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
 STUDENTS IN FREQUENCY DISTRIBUTIONS: 12
 STUDENTS TESTED: 12

Test: Biology
 Form Code: 4BMFC
 Institution: Mesa State College
 Cohort: Fall 2005-Spring 2006 Biology
 Closed on: August 31, 2006

TOTAL TEST		
Scaled Score Range	Number in Range	Percent Below
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	0	100
170-174	1	96
165-169	3	84
160-164	0	84
155-159	4	68
150-154	8	36
145-149	4	20
140-144	5	0
135-139	0	0
130-134	0	0
125-129	0	0
120-124	0	0

Scaled Score Range
100
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24

	Mean	Standard Deviation
Total Test Scaled Score	153	8
Subscore 1	51	10
Subscore 2	51	12
Subscore 3	54	9
Subscore 4	55	8

Students responding to less than 50% of the questions: 0
 Students in frequency distribution: 25
 Students tested: 25

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Test: Biology
 Form Code: 4BMFC
 Institution: Mesa State College
 Cohort: Fall 2005-Spring 2006 Biology
 Closed on: August 31, 2006

TOTAL TEST		
Scaled Score Range	Number In Range	Percent Below
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	0	100
170-174	1	100
165-169	3	96
160-164	0	84
155-159	4	88
150-154	8	36
145-149	4	20
140-144	5	0
135-139	0	0
130-134	0	0
125-129	0	0
120-124	0	0
Total Test Scaled Score	Mean	Standard Deviation
Subscore 1	153	8
Subscore 2	51	10
Subscore 3	51	12
Subscore 4	54	9
Subscore 4	55	8

Scaled Score Range	Subscore 1 Cell Biology		Subscore 2 Molecular Biology and Genetics		Subscore 3 Organismal Biology		Subscore 4 Population Biology, Evolution, and Ecology	
	Number In Range	Percent Below	Number In Range	Percent Below	Number In Range	Percent Below	Number In Range	Percent Below
95-99	0	100	0	100	0	100	0	100
90-94	0	100	0	100	0	100	0	100
85-89	0	100	0	100	0	100	0	100
80-84	1	96	0	100	0	100	0	100
75-79	0	96	0	100	0	100	0	100
70-74	0	96	2	92	0	100	0	100
65-69	2	88	1	88	0	100	0	100
60-64	2	80	1	84	3	88	5	80
55-59	1	76	6	60	5	68	3	68
50-54	7	48	5	40	4	52	6	44
45-49	5	28	5	20	5	32	3	32
40-44	4	12	0	8	6	8	6	8
35-39	3	0	2	12	1	4	2	0
30-34	0	0	2	4	0	4	0	0
25-29	0	0	0	4	1	0	0	0
20-24	0	0	1	0	0	0	0	0

Students responding to less than 50% of the questions: 0
 Students in frequency distribution: 25
 Students tested: 25

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology
Form Code: 4BMFC
Institution: Mesa State College
Cohort: Fall 2005-Spring 2006 Biology
Closed on: August 31, 2006

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	36
2	Cellular Structure, Organization, Function	56
3	Molecular Biology and Molecular Genetics	44
4	Diversity of Organisms	47
5	Organismal - Animals	61
6	Organismal - Plants	47
7	Population Genetics and Evolution	63
8	Ecology	55
9	Analytical Skills	55

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **25**

Students tested: **25**

DEPARTMENTAL DEMOGRAPHIC SUMMARY

Test: Biology
 Form Code: 4BMFC
 Institution: Mesa State College
 Cohort: Fall 2005-Spring 2006 Biology
 Closed on: August 31, 2006

	Number of Students	Percent of Students
Gender		
Male	8	32
Female	17	68
No Response	0	0
Ethnicity		
American Indian or Alaskan Native	1	4
Asian American or Pacific Islander	0	0
Black or African American	0	0
Mexican American	0	0
Puerto Rican	0	0
Latin American or Other Hispanic	1	4
White	21	84
Other	2	8
No Response	0	0
Educational Level		
Freshman	0	0
Sophomore	0	0
Junior	0	0
Senior	23	92
Graduate	2	8
Other	0	0
No Response	0	0
Transfer Student		
No	17	68
Yes	8	32
No Response	0	0
Enrollment Status		
Full-time	24	96
Part-time	1	4
No Response	0	0
Best Language		
English	25	100
Other	0	0
Both	0	0
No Response	0	0

	Number of Students	Percent of Students
Major Distance Learning Courses		
None	23	92
Less than 40%	2	8
40% to 90%	0	0
More than 90%	0	0
No Response	0	0
Overall Undergraduate GPA		
3.50 - 4.00	10	40
3.00 - 3.49	12	48
2.50 - 2.99	3	12
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	0	0
Major Field GPA		
3.50 - 4.00	13	52
3.00 - 3.49	8	32
2.50 - 2.99	4	16
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	0	0
Education Planned		
Bachelors	3	12
Masters	9	36
Doctoral	9	36
Other	0	0
Undecided	4	16
No Response	0	0

The PRAXIS Series
Professional Assessments for Beginning Teachers: ETS National Exams

Testing Period 09/01/2004 through 08/31/2005

All candidates admitted to the Mesa State College teacher education program are required to pass PRAXIS I (PPST: Pre-Professional Skills Tests) exams in reading, writing, and mathematics with a minimum score of 173. These exams are usually taken the semester prior to entry into the program, generally during sophomore year (second semester) or junior year (first semester). They can serve as a part of our general education assessment in the areas of English and Mathematics.

PPST-Reading

	All examinees, nationally	MSC Examinees
Number of examinees	89,231	133
Highest observed score	187	186
Lowest observed score	151	167
Median	179	180
Average Performance Range	174-183	176-183

PPST-Writing

	All examinees, nationally	MSC Examinees
Number of examinees	90,103	137
Highest observed score	190	184
Lowest observed score	151	168
Median	175	176
Average Performance Range	172-177	174-178

PPST-Mathematics

	All examinees, nationally	MSC Examinees
Number of examinees	89,706	133
Highest observed score	190	190
Lowest observed score	151	164
Median	178	180
Average Performance Range	173-183	177-184

The PRAXIS Series
Professional Assessments for Beginning Teachers: ETS National Exams

Testing Period 09/01/2004 through 08/31/2005

All teacher education candidates in Colorado must pass a content knowledge exam in their subject area before beginning student teaching. CDE regulates the exams acceptable for meeting this requirement and also works with CCHE in establishing state cut scores for the exams.

K-12 areas (art, music, physical education) must take the state specific exam PLACE. Elementary education and all secondary areas have a choice of taking either PLACE or PRAXIS II exams. We recommend that candidates take the PRAXIS II exam as it is a nationally recognized exam and is easily transferable to other states should a candidate decide to move some place other than Colorado.

Exams are generally taken the semester before the student teaching semester or first semester junior year. Most of the content classes have been taken by the candidate at this point in the program. These exam scores can serve as a part of the program assessment for the following areas: Elementary Education, English, Mathematics, Science, and Social Studies.

PRAXIS II – Elementary Education

	All examinees, nationally	MSC Examinees
Number of examinees	38,821	69
Highest observed score	200	197
Lowest observed score	100	133
Median	161	170
Average performance range	149-174	157-177

*CO required passing score: 147

Detailed Score Information

Test Category	National average % correct	State average % correct	MSC % average correct
Language Arts	79	80	83
Mathematics	68	71	74
Social Studies	61	64	65
Science	64	68	69

PRAXIS II – English Literature & Composition

	All examinees, nationally	MSC Examinees
Number of examinees	14,833	16
Highest observed score	200	195
Lowest observed score	108	161
Median	176	179.5
Average performance range	164-187	175-185

* CO required passing score: 162

Detailed Score Information

Test Category	National average % correct	State average % correct	MSC % average correct
Reading and understanding text	75	77	79
Language & linguistics	69	69	68
Composition & Rhetoric	79	81	85

PRAXIS II – Social Studies

	All examinees, nationally	MSC examinees
Number of examinees	13,991	12
Highest observed score	200	197
Lowest observed score	100	154
Median	165	173
Average performance range	154-177	158-186

*CO required passing score:150

Detailed Score Information

Test category	National average % correct	State average % correct	MSC average correct
United State history	64	64	69
World history	63	66	72
Government/civics/political science	67	67	68
Geography	65	70	77
Economics	58	61	64
Behavioral sciences	65	69	76

PRAXIS II – General Science

	All examinees, nationally	MSC Examinees
Number of examinees	2,360	13
Highest observed score	200	191
Lowest observed score	101	153
Median	167	162
Average performance range	153-180	156-174

*CO required passing score: 152

Detailed Score Information

Test Category	National average % correct	State average % correct	MSC % average correct
Scientific methodology, techniques & history	66	69	73
Physical Sciences	65	65	63
Life Sciences	64	64	62
Earth Sciences	69	72	70
Science, Technology & Society	71	73	72

PROGRAM ASSESSMENT REPORT

Biological Sciences
(Instructional Degree Program)

Bachelor of Science
(Degree Level)

2004-2005
(Assessment Period Covered)

November 2005
(Date Submitted)

Submitted By: Denise McKenney
(Department Head or Faculty Assessment Representative)

Expanded Statement of Institutional Purpose Linkage:

Institutional Mission / College Goals Reference:

From the Mission Statement: "Mesa State College shall offer liberal arts and sciences programs..." "Mesa state values teaching, learning, and student-faculty interaction. We provide our students with expanded opportunities to participate in research and active hands-on learning as a supplement to the classroom."

Intended Educational (Student) Outcomes:

1. Graduates will demonstrate knowledge in the biological sciences.

2. Students will acquire modern laboratory, field and/or analytical skills.

3. Students will be successful in post baccalaureate experiences with regard to graduate education and employment.

(Please Copy and Paste to create space for additional Student Outcomes, if needed)

Intended Educational (Student) Outcome #1:

Graduates will demonstrate knowledge in the biological sciences.

First Means of Program Assessment for Outcome #1:

1a. Means of Program Assessment and Criteria for Success: Students are required to take the Biology MFT Exam. In addition, the Education Department administers the PRAXIS exam to biology majors seeking science licensure prior to student teaching in their senior year. The criterion for success on both exams is that the majority of students (>50%) will score at or above the national average and/or the mean score of the group will be at or above the national average.

1a. Summary of Assessment Data Collected: This year 39 students took the MFT. Thirty-eight percent of the students scored 154 or above, compared to the national average of 154.2 (based on 03-04 national average). However, 66% scored 150 or higher, so there was a significant group that was just below the national average. On the PRAXIS, 13 students took the exam and scored an average range of 156-174, compared to the national range of 153-180. There are five PRAXIS test categories. In "Scientific methodology, techniques and history", our students scored 73% correct compared to the national of 66% correct; in "Physical sciences", they scored 63% compared to the national of 65%; in "Life sciences", they scored 62% compared to the national of 64%; in "Earth sciences", they scored 70% compared to the national of 69%; and in "Science, technology and society, they scored 72% compared to the national of 71%.

1a. Use of Results to Improve Program: The results on the MFT are a low this year, at least compared to the national average. This is difficult to interpret. My national average comparison number may not be accurate. On the other hand 66% scored at or above 150, so perhaps no action is required. On the PRAXIS exam, it is apparent that changes to our program initiated several years ago have dramatically improved our educational goals. When our teacher licensure program was reduced from 144 hours to 122 hours, we had dropped second semesters of other sciences and left the Biology degree intact. However, those students frequently failed their science licensure exam. Our program was changed to more of a general science degree and less of a biology degree. The current PRAXIS exam indicated that the program change was effective, although perhaps better selection of Biology course work is needed to improve the "Life Sciences" score. I would expect Biology majors to have a higher score.

Second Means of Assessment for Outcome #1:

1b. Means of Program Assessment and Criteria for Success: An exit ~~exam~~^{survey} was given to graduating seniors. Please note that we are having a problem with low return rates, so the accuracy of the data is suspect. It would also appear that females are more likely to return the survey, with 13 female responses and only 2 male responses. Success will be achieved if at least 70% of respondents are somewhat or very satisfied.

1b. Summary of Assessment Data Collected: The results of the survey are attached below. In section 8, 89% of the respondents were very satisfied or somewhat satisfied. On questions 11 and 12, 80% of the respondents felt the Biology program prepared them for their career and were satisfied with their experiences at MSC.

1b. Use of Results to Improve Program: There were a few comments in the written section that suggest that advising is inadequate. This may need further action if this trend continues. We also need to improve response rates. If 39 students take an MFT exam, but only 15 completed surveys are returned, we are missing the opinions of a large portion of our students.

Appendix: Biology Exit Survey Results for Fall 04-Spring 05

Biological Sciences Graduation Exit Survey Mesa State College

In order for us to evaluate and improve our program delivery please take a few moments to fill out the survey below and return it to the Chair of the Biology Department (Wubben 246) or the Administrative Assistant for PES (Wubben 238) and the Biological Sciences. If you wish to mail the form back the address is:

Chair, Biological Sciences
Mesa State College
1100 North Avenue
Grand Junction, CO 81501-3122

1. What is your major

 10 BS in Biological Sciences

 3 BS in Biological Sciences-Premed

 1 BS in Biological Sciences Secondary Teacher Certification

 1 AS in Biological Sciences

2. What is your sex

13 female

2 male

3. What was your class standing when you enter the biology program at MSC

8 freshman (first time)

0 freshman (transfer)

3 sophomore

2 junior

2 senior

4. Have you primarily been a full time or part time student

15 full time

0 part time

5. While at MSC during the academic semesters did you work out side of school

6 mostly part time

5 mostly full time

3 intermittently

1 not at all

6. How much difficulty did you have financing your studies at MSC

9 no difficulty

3 some difficulty

3 great difficulty

7. Which best describes your post graduation plans

8 job related to biology

4 graduate school (Masters or PhD) or Professional school (MD, DVM, etc.)

2 job not related to biology

0 military

1 teaching

8. Please rate the criteria below based on your experiences in Biology at MSC:

8.1 Availability of biology classes

4 very satisfied

10 somewhat satisfied

0 neither satisfied nor dissatisfied

0 somewhat dissatisfied

1 very dissatisfied

8.2 Availability of Physical Sciences classes

7 very satisfied

6 somewhat satisfied

1 neither satisfied nor dissatisfied

0 somewhat dissatisfied

1 very dissatisfied

8.3 Usefulness of texts and course materials

 6 very satisfied
 7 somewhat satisfied
 1 neither satisfied nor dissatisfied
 0 somewhat dissatisfied
 1 very dissatisfied

8.4 Access to faculty

 13 very satisfied
 2 somewhat satisfied
 0 neither satisfied nor dissatisfied
 0 somewhat dissatisfied
 0 very dissatisfied

8.5 Content and structure of the major

 8 very satisfied
 4 somewhat satisfied
 2 neither satisfied nor dissatisfied
 0 somewhat dissatisfied
 1 very dissatisfied

8.6 Quality of advising about course work in your major

 9 very satisfied
 4 somewhat satisfied
 0 neither satisfied nor dissatisfied
 1 somewhat dissatisfied
 1 very dissatisfied

8.7 Overall quality of assistance provided by the department

 12 very satisfied
 3 somewhat satisfied
 0 neither satisfied nor dissatisfied
 0 somewhat dissatisfied
 0 very dissatisfied

8.8 Opportunities for useful non-classroom experiences

 4 very satisfied
 7 somewhat satisfied
 2 neither satisfied nor dissatisfied
 1 somewhat dissatisfied
 1 very dissatisfied

8.9 Quality of facilities and equipment in the laboratories

 7 very satisfied
 7 somewhat satisfied
 0 neither satisfied nor dissatisfied
 1 somewhat dissatisfied
 0 very dissatisfied

9. Please indicate your level of agreement/disagreement with the following statements:

9.1 My major program was too difficult academically

- 0 strongly agree
- 1 agree
- 3 neither agree nor disagree
- 9 disagree
- 2 strongly disagree

9.2 Required courses were offered with reasonable frequency

- 0 strongly agree
- 10 agree
- 4 neither agree nor disagree
- 0 disagree
- 1 strongly disagree

9.3 Class sizes were conducive to learning

- 9 strongly agree
- 6 agree
- 0 neither agree nor disagree
- 0 disagree
- 0 strongly disagree

9.4 Faculty members were genuinely interested in my progress

- 8 strongly agree
- 5 agree
- 1 neither agree nor disagree
- 1 disagree
- 0 strongly disagree

9.5. There were opportunities to participate in independent projects, internships and community service

- 2 strongly agree
- 8 agree
- 4 neither agree nor disagree
- 1 disagree
- 0 strongly disagree

9.6 Course content reflected current trends in my field

- 5 strongly agree
- 7 agree
- 1 neither agree nor disagree
- 2 disagree
- 0 strongly disagree

9.7 Degree requirements were relevant to my professional goals

 2 strongly agree
 7 agree
 3 neither agree nor disagree
 2 disagree
 1 strongly disagree

9.8 I would recommend the biology program to others interested in my field of study

 9 strongly agree
 4 agree
 0 neither agree nor disagree
 1 disagree
 1 strongly disagree

10. On a scale of 1 to 5, with 1 being “not at all” and 5 being “a great deal” please rate how our program helped you with the following skill areas:

10.1 gave me a sense of competence in my major field of study

1	2	3	4	5
0	1	1	9	4

10.2. provided the foundation for graduate study

1	2	3	4	5
0	1	2	9	3

10.3 helped me understand current issues

1	2	3	4	5
0	0	2	7	6

10.4 allowed me to relate the application of theory to practical situations

1	2	3	4	5
0	0	3	6	6

10.5 helped me understand human diversity

1	2	3	4	5
0	0	4	3	8

10.6 helped me to learn to access information from electronic data bases and bibliographic print sources

1	2	3	4	5
1	0	5	3	6

10.7 helped me enhance my critical thinking skills

1	2	3	4	5
0	0	2	8	5

10.8 helped me enhance my quantitative reasoning skills

1	2	3	4	5
0	0	2	8	5

10.9 helped me enhance my written and communication skills

1	2	3	4	5
0	2	0	8	5

10.10 helped me enhance my oral communication skills

1	2	3	4	5
0	1	3	7	4

10.11 helped me enhance my practical laboratory and/or field skills

1	2	3	4	5
0	0	0	5	10

11. How useful has your education in the Biology program prepared you for a career or advanced study:

4 extremely useful
 7 very useful
 3 moderately useful
 0 slightly useful
 1 not very useful

12. How satisfied are you with your overall experience at MSC

11 very satisfied
 3 somewhat satisfied
 0 neither satisfied nor dissatisfied
 1 somewhat dissatisfied
 0 very dissatisfied

13. If you have any additional comments please write them in the space below, and thank you for completing this survey.

-events should be publicized better; advising should be enthusiastic, energetic, and thorough

-advisor problem; lousy selection of courses; had to take un-needed courses

-bio program great; professors really great

-very pleased; better background because of lab work; excellent professors

-need more wildlife courses; DOW and wildlife areas close by

-more botany courses; need Masters

Intended Educational (Student) Outcome #2: Students will acquire modern laboratory, field, and/or analytical skills

First Means of Assessment for Outcome #2:

2a. Means of Program Assessment and Criteria for Success: The exit exam provides some questions that relate to the quality of our laboratories. Success will be achieved if 70% of the respondents are very or somewhat satisfied or they chose 4 or 5 on the rating scale.

2a. Summary of Assessment Data Collected: On the exit exam question 8.9 "quality of facilities and equipment in laboratories", 93% were very or somewhat satisfied. On program rating 10.11 "helped me enhance my practical laboratory and/or field skills", 100% of the respondents choose a 4 or 5.

2a. Use of Results to Improve Program: While there are still issues with the low response rate for the exit survey, students seem satisfied with their laboratory and field experiences. Better questions could pin-point areas for improvement.

Second Means of Assessment for Outcome #2:

2b. Means of Program Assessment and Criteria for Success: Employers using a summary performance form on the internship contract will evaluate internship performance where technical skills and knowledge are used. Quantitative ratings of regarding performance include: Relations with others, judgment, ability to learn, attitude, dependability, quality of work, punctuality. These categories are rated from 5 to 1 except punctuality, which is 5 or 1. The mean of means for all categories must exceed 4.0.

2b. Summary of Assessment Data Collected: Based on five internships for 04-05, the mean of means for performance was 4.52.

2b. Use of Results to Improve Program: Based on internships, no improvements are planned.

Intended Educational (Student) Outcome #3: Students will be successful in post-baccalaureate experiences with regard to graduate education and employment.

First Means of Assessment for Outcome #3:

3a. Means of Program Assessment and Criteria for Success: Students are tracked to determine employment success or professional school admissions. We expect that 70% of our graduates will be employed in a biology related field or have been admitted to graduate school, medical school or other health related professional school.

3a. Summary of Assessment Data Collected: Of the 24 students that have been tracked, 24% were accepted into graduate school, 19% were accepted into medical school, and 57% were employed in a biology related field (types of jobs include research techs, Colorado Parks and Recreation, lab techs, DOW, science teacher), for a total of 100% success.

3a. Use of Results to Improve Program: Overall, our graduates are finding employment or are continuing their education in medical or graduate schools. However, our data collection needs to be improved. Those that are successful have been in contact with their advisors, while we have no data on other graduates

Second Means of Assessment for Outcome #3:

3b. Means of Program Assessment and Criteria for Success: An alumni /employer/graduate or medical school survey has yet to be developed. Such a survey is planned for next year.

3b. Summary of Assessment Data Collected: No data

3b. Use of Results to Improve Program: No data

PROGRAM ASSESSMENT PLAN

Biological Sciences
(Instructional Degree Program)

Bachelor of Science
(Degree Level)

2005-2006
(Assessment Period Covered)

December 2005
(Date Submitted)

Submitted By: Denise McKenney
(Department Head or Faculty Assessment Representative)

Expanded Statement of Institutional Purpose Linkage:

Institutional Mission / College Goals Reference:

From the Mission Statement: "Mesa State College shall offer liberal arts and sciences programs..." "Mesa state values teaching, learning, and student-faculty interaction. We provide our students with expanded opportunities to participate in research and active hands-on learning as a supplement to the classroom."

Intended Educational (Student) Outcomes:

1. Graduates will demonstrate knowledge in the biological sciences.

2. Students will acquire modern laboratory, field and/or analytical skills.

3. Students will be successful in post baccalaureate experiences with regard to graduate education and employment.

(Please Copy and Paste to create space for additional Student Outcomes, if needed)

Intended Educational (Student) Outcome #1:

Graduates will demonstrate knowledge in the biological sciences.

First Means of Program Assessment for Outcome #1:

1a. Means of Program Assessment and Criteria for Success: Students will be required to take the Biology MFT Exam. In addition, the Education Department will administer the PRAXIS exam to biology majors seeking science licensure prior to student teaching in their senior year. The criterion for success on both exams will be that the majority of students (>50%) will score at or above 50%. In consultation with Sonia Branson, the MFT acceptable percentage may be adjusted.

Second Means of Assessment for Outcome #1:

1b. Means of Program Assessment and Criteria for Success: An on-line exit survey will be given to graduating seniors. The survey will be based on the paper survey of previous years, but will be fine-tuned to more accurately determine student goals within the program.

Intended Educational (Student) Outcome #2: Students will acquire modern laboratory, field, and/or analytical skills

First Means of Assessment for Outcome #2:

2a. Means of Program Assessment and Criteria for Success: The exit survey provides some questions that relate to the quality of our laboratories. Success will be achieved if 70% of the respondents are very or somewhat satisfied or they chose 4 or 5 on the rating scale.

Second Means of Assessment for Outcome #2:

2b. Means of Program Assessment and Criteria for Success: Surveys for employers and graduate school or professional school supervisors, as well as alumni are being developed in with Sonia Branson. Some of the questions will specifically relate to the lab skill of our graduates, where appropriate.

Intended Educational (Student) Outcome #3: Students will be successful in post-baccalaureate experiences with regard to graduate education and employment.

First Means of Assessment for Outcome #3:

3a. Means of Program Assessment and Criteria for Success: Students are tracked to determine employment success or professional school admissions. We expect that 70% of our graduates will be employed in a biology related field or have been admitted to graduate school, medical school or other health related professional school.

Second Means of Assessment for Outcome #3:

3b. Means of Program Assessment and Criteria for Success: An alumni /employer/graduate or medical school surveys will be developed this year.

Biological Sciences Graduation Exit Survey

Mesa State College

In order for us to evaluate and improve our program delivery please take a few moments to fill out the survey below and return it to the Chair of the Biology Department (Wubben 246) or the Administrative Assistant for PES (Wubben 238) and the Biological Sciences. If you wish to mail the form back the address is:

Chair, Biological Sciences
Mesa State College
1100 North Avenue
Grand Junction, CO 81501-3122

1. What is your major
 - BS in Biological Sciences
 - BS in Biological Sciences-Premed
 - BS in Biological Sciences Secondary Teacher Certification
 - AS in Biological Sciences

2. What is your sex
 - female
 - male

3. What was your class standing when you enter the biology program at MSC
 - freshman (first time)
 - freshman (transfer)
 - sophomore
 - junior
 - senior

4. Have you primarily been a full time or part time student
 - full time
 - part time

5. While at MSC during the academic semesters did you work out side of school
 - mostly part time
 - mostly full time
 - intermittently
 - not at all

6. How much difficulty did you have financing your studies at MSC
 - no difficulty
 - some difficulty
 - great difficulty

7. Which best describes your post graduation plans

- job related to biology
- graduate school (Masters or PhD) or Professional school (MD, DVM, etc.)
- job not related to biology
- military
- teaching

8. Please rate the criteria below based on your experiences in Biology at MSC:

8.1 Availability of biology classes

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.2 Availability of Physical Sciences classes

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.3 Usefulness of texts and course materials

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.4 Access to faculty

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.5 Content and structure of the major

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.6 Quality of advising about course work in your major

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.7 Overall quality of assistance provided by the department

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.8 Opportunities for useful non-classroom experiences

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

8.9 Quality of facilities and equipment in the laboratories

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

9. Please indicate your level of agreement/disagreement with the following statements:

9.1 My major program was too difficult academically

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.2 Required courses were offered with reasonable frequency

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.3 Class sizes were conducive to learning

- strongly agree

- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.4 Faculty members were genuinely interested in my progress

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.5. There were opportunities to participate in independent projects, internships and community service

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.6 Course content reflected current trends in my field

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.7 Degree requirements were relevant to my professional goals

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.8 I would recommend the biology program to others interested in my field of study

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

9.9 I think MSC should develop and offer a Master's degree in Biology

_____ strongly agree

_____ agree

_____ neither agree nor disagree

_____ disagree

_____ strongly disagree

10. On a scale of 1 to 5, with 1 being "not at all" and 5 being "a great deal" please rate how our program helped you with the following skill areas:

10.1 gave me a sense of competence in my major field of study

1 2 3 4 5

10.2. provided the foundation for graduate study

1 2 3 4 5

10.3 helped me understand current issues

1 2 3 4 5

10.4 allowed me to relate the application of theory to practical situations

1 2 3 4 5

10.5 helped me understand human diversity

1 2 3 4 5

10.6 helped me to learn to access information from electronic data bases and bibliographic print sources

1 2 3 4 5

10.7 helped me enhance my critical thinking skills

1 2 3 4 5

10.8 helped me enhance my quantitative reasoning skills

1 2 3 4 5

10.9 helped me enhance my written and communication skills

1 2 3 4 5

10.10 helped me enhance my oral communication skills

1 2 3 4 5

10.11 helped me enhance my practical laboratory and/or field skills

1 2 3 4 5

11. How useful has your education in the Biology program prepared you for a career or advanced study:

- extremely useful
- very useful
- moderately useful
- slightly useful
- not very useful

12. How satisfied are you with your overall experience at MSC

- very satisfied
- somewhat satisfied
- neither satisfied nor dissatisfied
- somewhat dissatisfied
- very dissatisfied

13. If you have any additional comments please write them in the space below, and thank you for completing this survey.

**BIOLOGICAL SCIENCES GRADUATION EXIT SURVEY
MESA STATE COLLEGE**

In order for us to evaluate and improve our program delivery please take a few moments to fill out the survey below.

SECTION 1 - General Information

What is your major?

- BS in Biological Sciences
- BS in Biological Sciences - Premed
- BS in Biological Sciences - Secondary Teaching
- AS in Biological Sciences

What is your gender?

- Male
- Female

What was your class standing when you entered the Biology program at MSC?

- First-time freshman
- Transfer
- Sophomore
- Junior
- Senior

Have you primarily been a full-time or part-time student?

- Full-time
- Part-time

While at MSC during the academic semesters did you work outside of school?

- Full-time
- Part-Time
- Intermittently
- Not at all

How much difficulty did you have financing your studies at MSC?

- No difficulty
- Some difficulty
- Great difficulty

Do you plan on attending graduate school after you graduate from MSC?

- Yes
- No

Have you obtained employment in your field once you graduate?

Yes

No

[Next](#)

[Clear](#)

If you answered yes to question 9, what will your starting salary be?

- Less than \$10,000
- \$10,999 to \$14,999
- \$15,000 to \$21,999
- \$22,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$59,999
- \$60,000 to \$69,999
- \$70,000 to \$79,999
- \$80,000 to \$89,999
- \$90,000 to \$99,999
- \$100,000 and up

[Next](#)

[Clear](#)

Which best describes your post graduation plans?

- Job related to Biology
- Job not related to Biology
- Graduate or Professional School
- Military
- Teaching

SECTION 2 - Please rate the criteria below based on your experiences in Biology at MSC:

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
Availability of biology classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of physical science classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Usefulness of texts and course materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to faculty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Content and structure of the major	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of advising about coursework in your major	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall quality of assistance provided by the department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities for useful non-classroom experiences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of facilities and equipment in the laboratories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Helped me to learn to access information from electronic databases and bibliographic print sources
- Helped me enhance my critical thinking skills
- Helped me enhance my quantitative reasoning skills
- Helped me enhance my written and communication skills
- Helped me enhance my oral communication skills
- Helped me enhance my practical laboratory and/or field skills

1 2 3 4 5

How useful has your education in the Biology program been in preparing you for a career?

How useful has your education in the Biology program been in preparing you for advanced study?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
How satisfied are you with your overall experience at MSC?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Submit

Clear

SECTION 3 - Please indicate your level of agreement/disagreement with the following statements:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
My major program was too difficult academically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Required courses were offered with reasonable frequency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Class sizes were conducive to learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faculty members were genuinely interested in my progress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There were opportunities to participate in independent projects, internships, and community service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Course content reflected current trends in my field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Degree requirements were relevant to my professional goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend the biology program to others interested in my field of study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SECTION 4 - On a scale of 1 to 5 (1 = not at all; 5 = a great deal) please rate the extent to which the Biology program helped you with the following skill areas:

	1	2	3	4	5
Gave me a sense of competence in my major field of study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provided the foundation for graduate study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped me understand current issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allowed me to relate the application of theory to practical situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped me understand human diversity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix 5: Public School Survey



**The Perception of Needs by Public School Science
Teachers in Colorado School District 51**

by

Dr. Gary Loren McCallister

June 1, 2006

JUSTIFICATION

In the spring of 2006 Dr. Denise McKenney asked me to conduct a study of the science teachers of Colorado School District 51. The purpose was to visit with science teachers throughout school district to inquire how the Biology Department might be of service to them best. This will enable us to be more interactive with the School District and plan programs that will meet their needs better.

METHOD AND MATERIAL

I initially contacted the Office of the Superintendent to obtain permission to visit campuses and speak to teachers. There I was referred to Mr. Mark Zipse the Personnel Director for the District. After visiting with Mark, he referred me to Ms. Donna Denison, the Curriculum Coordinator. Ms. Denison wanted to involve Ms. Penny Teeters who is a part time administrator over Science Curriculum issues. After some delay setting up a three way meeting, Ms. Denison encouraged me to contact Ms. Teeters directly. Ms. Teeters arranged for me to meet with three teams of science teachers who were the curriculum committee leaders from several different schools at the three major grade levels: elementary, middle school, and high school. This effort involved input from a total of fourteen teachers.

I later was able to speak to five additional teachers by contacting personal friends and acquaintances in the district. The total teachers interviewed for this project then was nineteen. I also spoke to two principles. The first principle I spoke to was a personal friend and we met by accident. His comments were intriguing so I sought out another friend who is a local principle to verify the opinions. I might have contacted more, except I ran out of time.

I describe my activities because they become relevant to, and exemplary of, some of the conclusions below. In the report that follows, I will try to outline the concerns of each of the groups of teachers. Normally one would withhold comment until after the results, but in many instances, to make comment in a separate section would be awkward and lead to confusion. Therefore editorial comments will be made in italics. A more general summation will be provided in the discussion.

RESULTS:

Elementary Science

1. Communications: These teachers feel especially isolated in their schools. Their schools are their families and they enjoy working there. But they have little or no contact between schools, and definitely none the college or science teachers at other levels. So much of elementary school curriculum is taken up with basics, they crave some support, communication and validation of science as an important activity. They decried that they had no knowledge of anything going outside their schools.

2. Continuing Education: Co STEP was cited repeatedly. Co-STEP was a National Science Foundation sponsored program run by BSCS in Colorado Springs, to upgrade the science education abilities in the elementary schools of Colorado. It allowed elementary school teachers to obtain a Master's Degree in Science Education over about a three year period, with many of the courses delivered within the district. The degree was awarded from Adams State College.

This was obviously a popular project that was viewed as being extraordinarily successful. There is now a cadre of Co-STEP grads in the district and they are the science leaders in the elementary schools.

The teachers requested:

A. Could the Co STEP cadre be used to deliver a new Co STEP?

B. Could a new round of Co STEP be initiated?

C. Could Mesa State develop such a program.

If we did offer any kind of training they stressed it needs to give credit and be low cost. They also suggested that half day Saturday workshops were best for elementary teachers for a variety of reasons.

The demands on elementary school teachers are huge, and increasing. They simply cannot indulge science for science's sake, and they are paid based on years and hours of school, so to expect anything else is unrealistic and unkind.

Curriculum Support: Teacher needs are content specific to their curriculum map. They especially need age and content specific activities, equipment and resources. They are currently developing their own curriculum so that part isn't even completely clear. But any help needs to look at their specific curriculum needs. (*See my comments on number four.*)

One suggestion was a team (faculty and students) that would come in and teach their class for a day, thereby teaching the teacher also. (*Apparently this was done by CU in our district a year or two ago.*)

3. Equipment: These teachers have NO equipment, NO place to store it if they did, NO security of stored material, NO aid for inventory control or maintenance, and NO hope that equipment or storage will be forthcoming from the district.

Even the district has little equipment they can borrow. Since their curriculum will be district wide, any request for equipment could be overwhelming as everyone would need the same equipment within the same time frame.

This is, of course, ridiculous. There is no reason everyone must teach the same thing at the same time. There is not even any reason everyone must teach the same thing. But someone in the district has inflicted this upon them in the name of standardization and there isn't much we can do about it.

4. Miscellaneous: They appreciate what John McConnell has done tremendously. Almost all the teachers have availed themselves of his lab and they suggest providing him greater support.

(This is problematic in that John will not always be with us. The whole success of his endeavor depends on the presence of a motivated, capable and available person. There is no guarantee that the district will continue his efforts beyond his involvement.)

Middle School

1. Communication: They had a lot to say about communication also. They do not find out about anything the college already has to offer. They would be interested in knowing about Sigma Xi talks, seminars, workshops, scientific meetings, speakers' bureau, etc.

However, it became obvious that there is a problem along a continuum of the communication pathway. For example, they admit to not reading their daily e-mail from the district, "News You Can Use". It is too big, and mostly irrelevant to their needs. However, the district restricts non-district communications to this venue to control internet usage. Then the district frequently does not post information it receives in a timely manner, or not at all. Finally the college has no central means of communicating with the district.

The college appears to have little interest at this point in working with the district. The district obstructs contact with individual teachers by not allowing direct content (see my description of what I had to go through to talk to a real teacher, even though I was willing to visit schools and teachers individually). Several people suggested setting up our own web pages at Yahoo, or using Blog technology or user groups, and circumventing the bureaucracies entirely.

2. Continuing Education: These teachers craved content instruction. They were less insistent on curriculum based content, but wanted to have opportunities to learn about science, by scientists and for scientists. *(They seem more ready to identify as scientists and admit to a strong personal interest.)* They suggested such things as:

Brown Bag symposia on topics

Refresher Classes

Technology (specifically life science technology)

(They were especially interested in genetics and cell biology changes that they felt they cannot keep up with.

Guest Speakers

(They asked what happened to the speakers' bureau.)

They also are developing a new curriculum, however, there was less concern that all help be curriculum based. They did explain that under their new curriculum they would have the following topics to address:

6th grade - earth science

7th grade - life science

8th grade - physical science

They also were very interested in Co STEP. Many were Co STEP alumni who had moved up to middle school from elementary. They generally wanted to see this recreated, or some other kind of science education Master's Degree that would serve all science teachers.

Again, low cost (perhaps tuition underwritten by grant money) and graduate credit were cited as mandatory. They cited \$45.00/hr. plus teachers pay. There was no consensus about times aid should be offered. They seemed to feel any time could work. However, they were not prepared to tackle all summer courses unless the project was big enough and led to a degree.

3. Equipment: Their concern for equipment was even greater than the elementary school teachers. They cited needs for skeletons, robotics, physical science demonstrations, aquaria/terraria. They all need lab equipment like centrifuges, water baths, and incubators, and microscopes (but to a lesser degree). They also cited our past projects with robotics and were very interested in pursuing that if they equipment, maintenance and inventory control could be handled for them.

High School

1. Communications: This became a mantra from all teachers, at all levels, whether talked to in groups or individually. The same points are all made under the other headings above. *(All the groups want better communication with everyone and everything, but for unique reasons. The elementary teachers feel estranged. The middle school teachers feel they are falling behind in science. The high school teachers want more interconnection between themselves at the various schools. Again, much talk about revolution, technology, bypassing bureaucracy, etc.)*

2. Continuing Education: These folks seemed most interested in having access to further education. They seemed to feel that good topics, graduate credit, cost and standards related are the most important factors. They suggested that they would be interested in short courses in a variety of forms, from two hour after school classes, Saturday or Weekend long classes or two week summer classes. But they also said they would be interested in various activities such as nature hikes, float trips, or scientific meetings.

They also brought up the idea of a team coming onto campus and taking over their classes for a day or two *(this was mentioned by middle school teachers as well. Apparently CU hit on a pretty popular activity. I'm not sure it was effective, but popular.)*

3. Equipment: They have the same problems as the other schools with space, maintenance and inventory control. They did say that any program to address this need would need to start with an inventory because some schools have some things and others have something else. Several schools have access to microscopes for example. They all felt the need for gel electrophoresis equipment and they all would like to see access to lego or Fischer robotics since these issues double for physical science and computer

technology. Again, the equipment must relate to curriculum, standards and texts. However, they were very interested in some kind of loaner system.

Administration:

I visited with two principles. The general consensus was that programs of almost any kind won't get to the teachers unless the principles are supportive. They generally had no idea what their science teachers needed. But when I shared what some of their comments were, they suggested that even programs built around the teachers own perceived needs wouldn't work much unless there was a push/pull from the principles. They, of course, didn't see the same weaknesses in communication as the teachers did, and didn't know about, or know what to do about, equipment needs. (*Money for equipment seems to be a problem no one in the district, from the highest level (school board and Superintendent) down seems to have considered. The mantra is, "there is no money". Equipment needs are well addressed when it comes to athletic uniforms, but appears to be ignored in the sciences.*) They also seemed to see the continued education needs of the teachers as personal responsibilities of the teacher.

DISCUSSION

The discussions involving public school teachers all revolved around about three major issues: communication, continuing education and equipment needs. These were not identified in that order by the teachers, who usually talked about continuing education first, equipment second and only got around to communication after brainstorming awhile. However, I think they started out discussing the traditional things that colleges are supposed to do for the public education system. The more they talked the more they seemed to generate ideas and focus on some of their non-traditional problems.

I am going to discuss them in the order of communications, continuing education then equipment because solutions to communications appear to be necessary before headway in the other arenas can be made. Also, a great deal of good could probably be done for less money by addressing this issue, whereas the other two issues require greater commitments of time and resources and thus may take longer to achieve.

Communications

There is a serious problem with communications in the public schools, at least as it applies to scientific fields of study and endeavors. This is illustrated by the difficulty I had contacting individual teachers. When I sought permission through channels I was taken through three levels of bureaucracy and then invited to meet with key "leaders" in a group meeting, rather than individually, even though I expressed willingness to seek out teachers individually. I would have preferred to speak with them one-on-one for more honest assessment and less group speak. I felt, though it was never stated categorically, that the administration preferred that I not meet teacher individually.

While the central administration has developed a newsletter that is sent daily entitled "News You Can Use", this seemed to be a joke to most science teachers I spoke too. None of them read it. It is too long, hard to sort through, and of little relevance.

Further, I know from past experience that many items sent in for teachers never make it to the newsletter, for whatever reason. However, the teachers also take themselves out of the communication loop by not seeking or accessing those communications that are available.

Communications between the college and the school district are especially poor because there appears to be no point-to-point contact between the two organizations. This is especially critical from the point of view of the sciences, since we already have a variety of events which might prove of interest to public school teachers, but which it is difficult for them to learn about: scientific meetings, seminars, demonstrations, posters sessions, etc. It does not appear that either organization, at this point, is aware of this problem, or else they have decided that it is not their problem (and they may be right in a political sense). The teachers themselves would circumvent the bureaucracies if they had time and resources to do so.

I am not sure what steps might need to be taken to improve communication. It may be that improving communication between the college and the district simply isn't an important use of tax payer money. However, attacking either of the other two issues without first addressing the very real communication issues is almost certainly a waste of time and resources. The communication issue probably is a campus wide/district wide issue, but the comments in this paper address specifically the science connection. The following are some suggestions that came out of the conversations with the teachers.

- designate a point to point contact between the two groups through which all communication would go, both ways.
- establish an internet user group where people could chat and post information.
- establish a web site where science information could be posted to the district with sources of contact for more information.
- establish an inter-group advisory board to consult on science issues and plan joint projects such as public speakers, activities, research projects or community service projects, etc.
- a designated person be given the responsibility of communicating with teachers through whatever means is available.

Continuing Education

There is a need for continuing education. However, overwhelmingly the interest was in a specific science education curriculum similar to that run several years ago by BSCS and NSF. The teachers much preferred a coherent program that led to a degree over sporadic classes. The ability to deliver such a program depends on the authority to grant graduate credit. It is not at all clear that present political and administrative support for a science education degree is available.

(It would be a shame if a general education degree were allowed to fill the need over a science education degree, especially considering the nature of the western slope and our dependence on agriculture and natural resources. We will end up with a bunch of educational administrators instead of people who understand physics, machinery, technology, the environment, and chemical and energy techniques and needs.)

If a coherent program cannot be delivered, then the second greatest interest is in curriculum, or standard specific, offerings in the form of short courses, seminars,

weekend courses or two week summer offerings. However, such courses must be inexpensive and carry college credit.

Some teachers (exclusively middle and high levels) expressed an interest in participating with the college when guest speakers came, or scientific meetings were held. In the past they have not done so, but it is impossible to tell if that was from lack of interest, or a communication problem. These same teachers were interested in re-establishing a speakers' bureau, although my experience in the past has been that it was seldom heavily utilized. Again, was that motivation or communication?

Apparently CU came to several schools a few years ago with a professor and some undergraduates, and took over science instruction for a couple of days at a time. They had a smorgasbord of subjects that teachers and students could choose from and the lessons were delivered by undergrads, but were well thought out and prepared. This appears to have been very popular, and at least anecdotally beneficial. I am sure from the description of the project that they must have been funded by a grant to pull it off. Perhaps a grant in this direction might be a useful contribution.

As one can see, the delivery of continuing education to the public schools is not entirely in our control, has numerous constraints and may require outside funds.

Equipment

In a community whose livelihood depends on an abundance of natural resources, the lack of political will in addressing the need for scientific equipment in the educational system is hugely embarrassing. Perhaps the schools have no greater need than to have at their disposal modern state of the art equipment for students to experience and learn on. Computers, robotics, data logging systems, standard lab equipment, and modern micro chemical and gel electrophoresis equipment is essential to teach and understand science. Mesa County has one of the poorest High School completion rates in the state, one of the least educated populace in Colorado, and one of the lowest standards of living. Coincidence? I don't think so.

Probably the single biggest contribution MSC could make to the education community would be to make an inventory of what is needed by the curriculum, obtain that equipment through grants, and establish a loaner system that could maintain, inventory and deliver/retrieve equipment to schools. However, this would also take the largest outlay of energy, time and resources of the three needs of the school. The western slope needs a regional warehouse of educational equipment.

CONCLUSION

Science teachers in Colorado School District 51 have several needs. They need, continuing education, equipment, and better communication between themselves and with the scientific community. Fostering communication between teachers, between the district and the college, and between college teachers and programs and public school teachers may not be the greatest need, but could be the most easily addressed and thus have beneficial effects most quickly.

The real needs of the teachers are joined at the hip. It does little good to provide educational opportunities, whether they are workshops or degree programs, if the teacher

cannot implement the knowledge with scientific equipment. However, providing equipment without training on its use and applications is also a waste of resources. Perhaps some combination of equipment and training such as the "science van" concept that has been successful in other communities could be beneficial.

Whatever approach is taken, care must be used to first determine curriculum so that the offered help is relevant to the need. A serious effort to change science education on the western slope of Colorado would probably entail an equipment warehouse approach with a training facility and in-field support.

A Review of the Department of
Biology (Undergraduate Program)

Mesa State College

Dec 5-7, 2007

By

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PREAMBLE

This evaluation was arranged by Dr. Cathy Barkley, Assistant Vice President of Academic Affairs, at Mesa State College. Dr. William Wyatt Hoback has expertise in ecology/evolutionary biology/entomology/ and freshwater ecosystems and has no formal or informal affiliation with Mesa State. Dr. Barkely provided a large packet of university/ college/ departmental information that is routinely a part of departmental reviews. This information arrived approximately one month prior to the on-site visit. I arrived in Grand Junction on the night of December 5 and the on-site visitation took place December 6, 2006. Dr. Denise McKenney, Head of the Department of Biology, served as the primary point of contact and during my visit, I sat in on 2 classes, and met with library personnel, IT personnel, members of the assessment committee, department faculty, program students, and President Foster. Dr. Mckenney gave me a tour of the Biology facilities and Paige Hatten gave me a tour of the campus.

II. INTRODUCTION

It was a pleasure to perform this evaluation. I commend Dr. McKenney and the Department of Biology for their excellent work in developing review materials; part of any review is self-study and the data provided were hopefully as beneficial for the department as they were for me. Faculty, staff, students, and administrators greeted me warmly, discussed issues openly and candidly, and were clearly interested in making the external evaluation a meaningful process. I found the atmosphere in biology at Mesa State to be friendly and relaxed but yet professional. Without question, faculty members in the Department are very dedicated and view the education of the students as their highest priority. Faculty also believe that scholarship is important both as a means of maintaining their own intellectual vitality and as a viable way of educating their students. I applaud the effectiveness of the department in teaching, research, and service.

This is no doubt that the basic problems within the department are directly related to the lack of physical space, the chronic under funding for equipment and lack of faculty to adequately teach the large number of students (320 majors +28 majors with teacher certification). Furthermore, the Biology Department provides a large service component to other academic programs within the University.

III. DEPARTMENT ADMINISTRATION

The faculty, staff, administration and students all view Dr. McKenney as an excellent administrator/educator and a very strong advocate for the department. There was a keen awareness that the Biology Department had made important steps in building core areas through new and replacement hires. In addition, the department has managed to fairly share very limited research and laboratory space- a direct result of Dr. McKenney's finesse. Moreover, the department has been very proactive in responding to assessment data through new hires to address program weaknesses. Furthermore, the department realizes that more hiring will likely take place in the near future as senior faculty reach the age of retirement and has begun discussions concerning their program needs. The departmental leadership and the faculty are committed to upholding and improving their excellent record of accomplishments. They genuinely feel that they are one of the very best departments at the College and I concur with their assessment.

IV. DEGREE PROGRAMS AND THE CURRICULUM

The department offers two undergraduate options although there are splits within the Biology option. There is a large enrollment (315+) in the BS program in Biology and a much smaller enrollment in the Biology Teacher Certification Program. In examining the data from the previous 5 years, enrollment of new students with declared majors in biology has held steady and has been approximately 95 per year.

The basic biology curriculum looks fairly standard although I would like to see more physics and chemistry required of all students majoring in biology. I applaud the department for allowing students to complete a senior research project. I can think of no better "capstone" course. Often a course in "evolution" is used as a capstone course; this is where assessment, major field tests, etc. can be administered. At present, the Department does not require such a course although one is offered.

Quite frankly, I find the biology portion of the University catalog difficult to follow for the different options (B.S., pre-professional, and teacher licensure). Students appear to be left "on their own" to choose classes with many electives available. I recommend that the Department review what they believe to be important core biological knowledge by all students and make a few more classes required. For example, my institution requires all students to take ecology, genetics, cell biology, and evolution along with the two course general biology sequence.

Currently students who pursue the B.S. in Biology option, need 20 hours of upper division courses towards the 120 total for graduation. However, students can currently take up to 10 hours of internship along with 7 hours of research and senior thesis. Although research prepares students for future jobs in the field, undergraduates may be missing out on the robustness afforded by Mesa State's liberal arts approach. I recommend that the department limit the number of independent hours a student can count towards their degree to perhaps 6 hours and thus increase the number of courses to which a student is exposed. This option will also help with upper division classes which sometimes suffer from low enrollment.

By my count, the Biology catalogue shows a total of 51 different courses (many with associated laboratories) offered by the Department of Biology. This seems like a very large number of courses especially with the heavy service load carried by the department and encouragement of research and research mentoring. It is my understanding that some of these courses have not been offered for a period of time and that others have not had sufficient enrollment to meet. I recommend that the Department examine the courses that it offers and establish a rotation for upper division courses. The Department should look for ways to reduce the number of courses offered and to clarify to students which options will be and will not be available. The undergraduate curriculum can greatly benefit from streamlining. The number of different courses is a sizeable offering given faculty size, laboratory space and resources. I have not determined how many "extra courses" it takes to offer such a diverse curriculum, but it is considerable.

If the department had a standard core (e.g., year of general biology, genetics, physiology, ecology, evolution) then other courses could be rotated and taught periodically. Considering the very heavy teaching loads of Biology faculty, there appears to be enough elective courses in the Biology major, so I strongly recommend that the Biology Curriculum Committee closely examine course offerings in the major at the earliest possible convenience. Courses to be combined, eliminated, etc. should consider student interest, program requirements and historical enrollments but also improving

faculty, facility, and program efficiency during a time of an explosion of information and new areas of investigation within the biological sciences. If courses are listed in the catalog but never offered, they need to be removed. Students voiced few complaints (see below) but they did mention that courses were not offered frequently enough.

In addition to the diversity of courses offered, there appears to be considerable overlap in some courses with the Environmental Science program. For example, both degree options offer their own version of entomology and fire ecology. Because Environmental Science is a small interdisciplinary program, the department and the Mesa State College administration should manage overlap and possibly consider merging the departments. Such a move would potentially have many positive impacts which are highlighted below.

Merging the departments would have immediate benefits by 1) increasing the amount of ecology courses able to be offered by the department. At present the Department offers popular courses in marine biology in Oregon and tropical ecology in Ecuador. However, no one in the department conducts research in the Colorado mountains or offers field experiences in this area. The Department needs to address this shortcoming either with a new hire or by merging talents with the Environmental Science Program; 2) merging the departments would enhance the ability to attract resources from the Colorado Division of Wildlife and others.; 3) merging the Departments would increase the number of options to undergraduates, perhaps increase the number of ecology students, and maximize space use in the building.

It is often difficult to determine from course outlines exactly the make-up of the laboratories. Although some courses I examined have very innovative laboratories, it is difficult to ascertain how many biology courses have "investigative laboratories". From the laboratories supplied, I feel that the Biology Department is doing a very good job at making students think critically, problem-solve etc. Only as a reminder to the faculty do I make the following statements. Students need to do labs that do not have answers- labs that make students do biology (i.e., make observations, design experiments, collect data, analyze data, interpret results and write reports). These labs, in some cases, do not have to be used in place of traditional labs but rather, they should be in addition to labs that already exist. In some courses, 3-4 labs/semester, all investigative is definitely the right approach. I would suggest two-to-three labs that run for 2-3 weeks each in all core courses and give the students the option of writing one of them up in some scientific journal format. Such an arrangement would give students critical thinking experience and the needed writing component often lacking in undergraduate science curricula. This seems to be most important as the faculty consider changes to Biology 105 (which is mostly sub-organismal and has high attrition rates with laboratory exercises that should be updated), Biology 106 and Biology 107. At present, few students take the entire sequence in three semesters, rather they wait to take the Biology of Plants until very late in their program. I recommend that the faculty consider switching to a 2 semester sequence that captivates student interest and prepares them for all classes within the major. By eliminating one course the curriculum could benefit from an additional required course (I would suggest Evolution or Ecology).

V. FACULTY/STAFF

I find the faculty in the department highly qualified to execute their duties as

teachers and scholars. My view is that all of the faculty know and accept the mission of a regional state college. I was extremely pleased to hear of the general "congeniality" of the department- it seems that almost everyone gets along. The ability to interact positively between/among colleagues is a very positive aspect of faculty professional lives.

There will likely be a number of retirements within the department within the next several years. It is absolutely imperative that these tenure lines be filled immediately so that the curriculum is not further compromised by lack of faculty.

I recommend that the department form a "departmental hiring committee" that will develop a hiring plan. It seems prudent to recommend that this team strive to receive ample input from ALL members of the department. How will faculty lines be replaced? What expertise will the department need/want? This will obviously be a dynamic document that can change, depending on who retires/resigns first, second, etc. Hiring "in kind" (i.e., a person with the same expertise as the faculty member that retired/resigned) might be warranted depending on courses needed within the curriculum. However, hiring a faculty member with a different expertise or different laboratory/field skills might be desirable. The committee might be relatively small but the newer faculty in the department need to have input on the composition of the future faculty. Mesa State Biology has lost a number of recently hired faculty to other institutions in recent years and the administration needs to give this some attention. Faculty leave, resign, etc. for a variety of reasons but I suspect lack of space, salary and lack of support for research/creative activities are likely reasons why faculty leave Mesa State.

The Department of Biology would greatly benefit from an added tenure-track position and I recommend that one be hired within the next two academic years. Although the enrollment increased substantially, the number of faculty lines has remained static for the past 5 years. The faculty/major ratio within biology is far different than that of other science departments at the institution and the major, which is extremely large, is likely to stay static or even grow in the next few years assuming national trends hold (i.e., an increase in interest in the health related sciences and life sciences in general.) if granted a new position, the area of expertise would have to be decided by the Chair in consultation with the faculty, though the department seems weakest in ecology especially at the regional level.

I strongly recommend that the department hire a "lecturer " person in the very near future; this needs to be a top priority. This person could coordinate undergraduate non-major laboratories and do lectures for this course. As it stands currently, there is no person dedicated to this task. Many laboratories (e.g., general biology, physiology, microbiology, etc.) require a huge amount of time to prepare and disassemble. Because the department has so many majors and offers so many courses, it is unreasonable to expect faculty to spend significant amounts of time preparing laboratories when a person with a BS or MS degree in Biology could be assigned this task (as well as coordinating student workers in the laboratory). Furthermore, as faculty opt to develop more "investigative laboratories" that include a research component, more time is needed to prepare experimental equipment, solutions, etc. This position could be shared with other departments in the building including Chemistry and Physics. As a cost-saving measure, if the Department is allowed to offer a graduate degree, MS students could take on the responsibility of teaching laboratories or at a minimum prepping for them.

VI. TEACHING LOADS/CONTACT HOURS/WEEK

Mesa State College is a regional state institution with a comprehensive mission that involves teaching, research, and service. To accomplish this mission, faculty require adequate time to prepare quality courses, conduct research and provide service to the Department, College, University, and professional societies and to the community. The teaching load or contact hours/week is extremely high within Biology at Mesa State College; in fact, the number of average contact hours/week is higher than most comparable institutions. This is a real concern because these contact hours rarely count the number of mentoring hours that faculty spend with undergrad research students. The fastest way to burn out faculty is to overwork them. Having said that, it seems that workloads are not distributed equally between and among faculty; perhaps large lecture sections and heavy teaching loads can be shifted periodically to help alleviate this situation.

As one would expect, the faculty are teaching a huge number of student credit hours every semester. The department is a very productive department, in every sense of the word, and it is very difficult to teach a quality curriculum with the number of students the department is now trying to service with the number of faculty on staff.

Because research/mentoring has become a more important part of the biology curriculum, the Chair will need to develop some creative ways to provide blocks of time where faculty/students can work without interruption.

To carve more time from busy faculty schedules is challenging and there are only a few ways to approach this. Some ideas are expressed below.

- A. Give faculty teaching load credit for supervising research in a manner consistent with teaching load credit for a regular course.
- B. Continue and initiate large sections of introductory biology lectures and other core and General Education courses. I understand that class size is a sensitive subject but feel that some adjustments can be made with no sacrifice in quality. Thus, it may be possible to fold several core lecture sections into one while retaining small laboratory sections. In this case, only one faculty member will be used for the lecture, freeing two faculty to work with students. Although this may present more work for the faculty member teaching a large lecture section, this responsibility could be rotated. I also realize that some of this is already being done.
- C. Consider developing a course entitled (Laboratory Teaching or Teaching Practicum) worth 1 semester hour credit. Students can enroll in this course up to 3-4 times throughout their undergraduate curriculum. Students should be required to have a fairly good GPA (perhaps 3.0 or better and have had successfully completed the course they are assisting in) to enroll in "Lab Practicum." Students will function as a Teaching Assistant, they will help prepare and disassemble laboratories AND serve as teaching aids in the laboratories. All students should be required to be totally responsible for at least one laboratory/semester. Faculty should be present at all times; the student assistants will gain a very rich experience in teaching that is unlike any learning experience they will have had as an undergraduate. Again, apparently a mechanism for this type of activity is already in place. I urge faculty to "look" for good students in the freshman and sophomore level classes. These students can be a tremendous help!

I recommend that the department work toward the goal of providing all tenure

track faculty with 3 hours of release time for research/ student mentoring per semester if possible, per year at minimum.

VII. PHYSICAL FACILITIES-Space/equipment

The Biology space/building is a major limiting factor for the Biology Department. A little painting, addition of window blinds and other cosmetic things can easily be completed and would greatly add to the learning atmosphere. A decision needs to be made concerning the animal care facility which is under-utilized and does not meet code if one of the faculty members were to obtain an NIH grant that used rodents.

The Department benefits from having a state-of-the-art microscopy laboratory with expensive (mostly donated) equipment. This facility requires more space and a few computers to be fully usable. In fact, part of the microscope laboratory is used as office space for a lecturer. This person should receive an office in another area and the Department should emphasize the existence of this equipment and use it in promotion. Given a slight increase in space, the microscope laboratory could be used for a new course (or a laboratory within an existing course such as histology, genetics, entomology, etc.) and undergraduate research.

The building should continue to be upgraded with the inclusion of technology in all rooms. Care should be taken to maintain equipment that allows all teaching styles (i.e. blackboards could be replaced with white boards or smart boards but not removed entirely). As new faculty are hired and as technology advances, the building needs to be sufficient to allow faculty to take advantage of these options. The faculty suffer from not having enough computers in the classroom to take advantage of modern teaching techniques for courses such as physiology. Lack of access to modern teaching aids (ranging from televisions and video equipment to equipment that exists but requires interfaces with computers) hurts students who continue for post-graduate education especially in health science fields.

Additional research space is needed. Although the faculty and department head are to be commended for their utilization of space and resources, the sharing of such limited research space limits productivity and severely restricts successful application for external grants. Productivity is limited by space but also by contamination especially for experiments in modern biology, genetics, and molecular biology. I strongly recommend that a space committee be formed within the Department and perhaps among all departments that have space in the science building.

With the help of the head, all of the rooms need to be inventoried by square footage, current usage and % usage. It is likely that the department will find that some laboratories are used very little and that possibly these rooms could be freed up by moving lectures/labs to other rooms. The space committee will almost certainly find some space. It is extremely important to understand that I am not suggesting "carving up what you already have"--rather the department should be rethinking what is done in each room currently and how space can be freed by looking at room allocation/time allocation.

The instructional laboratories appear to be well designed but very poorly equipped. I noticed basic microscopes that are not functional; teaching equipment in general is lacking in the laboratories. Students need to be trained with modern equipment to be prepared to work in this century. Without modern equipment, the department will soon be teaching "the theory of biology."

Biology is an expensive discipline and will become even more so as technology

advances. Apparently the Biology Department has a very limited annual equipment budget. If this is the case, the Administration needs to realize that the price of technology continues to increase and the next decade will be a time of tremendous technology development in all areas, including biology. Service contracts for high technology equipment also need to be built into budgets to ensure that the equipment is always available for teaching and research. Teaching requires personal computers and laptops are currently unavailable.

There is obviously no quick fix for the equipment shortage/problem in the department. However, I strongly recommend that the department examine their "laboratory and/or field trip fees"; monies that each student pays for courses that have laboratories. Laboratory fees can vary with course with the logic being that some courses are much more expensive (e.g., microbiology) to teach than others; that decision should be made by the department in consultation with the Administration. It is very important that laboratory fees will be allowed to purchase equipment, particularly microscopes, and not just commodities used in the laboratory. These monies can help to defray costs of running courses that require a significant amount of supplies or travel and can help with equipment purchases. "Lab fees" are commonplace in science labs across the country; Mesa State is an inexpensive school and modest lab fees would not deter the number of students attending the University or majoring in the life sciences. Students that I talked with had no problem with increased laboratory fees given that the money would go DIRECTLY into purchasing modern equipment for the Biology Department.

The faculty should also be encouraged to continue to submit grant proposals to fund individual research projects. Programs providing funding for such projects are available from such agencies as NSF-RUI, NIH-AREA, USDA-Pilot Studies, etc. The Head and the Administration need to be able to provide faculty release time for these endeavors; one grant funded pays for a lot of temporary help.

VIII. RESEARCH/CREATIVE ACTIVITIES

Given the faculty teaching load (and emphasis on teaching at Mesa State College), I was very surprised by the research option for all seniors. It is quite obvious that Biology faculty have embraced research in a healthy way. Having said that, faculty receives no teaching credit for mentoring and it adds to an already incredibly high workload.

I feel very strongly that a discovery-oriented approach to learning should permeate science education throughout the curriculum. The opportunity for undergraduate students to do research will effectively draw more students to careers in science teaching and research, and continuing involvement in research keeps faculty excited and stimulating as classroom teachers. There is no doubt that student-mentor relationships are experiences that often ultimately result in further graduate training. The more the department can encourage this type of activity, the stronger the department will be. Faculty efforts in these areas MUST be included in their decisions for tenure and promotion and mentoring efforts need to be considered as part of regular workload. Moreover, the Department should pursue the option of offering a MS degree in Biology immediately. This would benefit students who are enamored with the research opportunities and would decrease faculty workload by allowing MS students to collaborate with undergraduate research students.

IX. MS IN BIOLOGY/ GRADUATE PROGRAM

I found faculty and students in Biology to be very interested in the possibility of a MS program at Mesa State College. In particular, I talked with two senior biology students who both would stay at Mesa State to continue the research that they started as undergraduates if this possibility was available. Instead, both are looking to other institutions to continue their education. Mesa State is well-situated geographically for a MS program. Moreover, the recent move of the forensic center to Grand Junction along with the Colorado Division of Wildlife's need for basic and applied research in the area would generate immediate interest, the possibility of external funding, and a way to reduce faculty teaching loads. With the diversity of courses offered currently in the department, and the ongoing research collaborations, I believe the addition of an MS program would be relatively simple.

Of course, the addition of a MS program would require modest funding for assistantships, procedures for thesis degree options, accreditation, etc. These needs should be considered and carefully weighed. At its initiation, I strongly recommend that the MS program be granted several Graduate Assistantships and that Assistantship salaries be competitive. For the MS program to maintain critical mass and really succeed, assistantships must become available which at a minimum provide tuition waivers. I also urge faculty to continue to seek outside funding so that they can supplement the incomes of graduate students. Perhaps the faculty can actively pursue "outside assistantships" or tuition waivers from the city, the state or private companies. However, the graduate program can not be carried indefinitely by extramural grants;

X. ASSESSMENT

The Biology Department at Mesa State College seems to have developed an adequate assessment plan. I must point out that assessment and accountability are here to stay in higher education and are already a requirement by accrediting agencies. The department uses the Major Field Aptitude Exam (Major Field Tests, Higher Educational Assessment 55-L, Educational Testing Service, Princeton, NJ 08541-001, 609/683-2272) as one instrument of assessing student outcomes. The faculty collect data from the exam, and then use these data to make adjustment in curriculum. I caution against using this exam as purely a number (i.e., single criterion) that students need to equal or exceed to declare curricular success or failure. Any good assessment plan needs several probes and even then it is often difficult to decide exactly how to use these data. Beyond the exam, the faculty currently use an "exit" survey of students. These data are useful and provide the department excellent insight into a variety of faculty/curricular topics. Results from this survey suggest that majors are pleased with the faculty and the curriculum.

Outside of the Department of Biology, Mesa State College would benefit from additional Assessment help. Currently, the assessment committee is staffed by faculty who serve a three year term. The director receives training at workshops and the coordinator receives release time equating to 0.25 FTE. The committee then relies on the hire of work study students to collate a substantial volume of data. Because of the importance of assessment and the time commitment, I recommend that Mesa State College immediately create a fulltime position for administering assessment on campus. In addition, I recommend the hire of a fulltime managerial position to add permanence to the assessment program, rather than relying on temporary and often

volunteer service.

One last word, across campus assessment should not be done for assessment's sake. Good assessment data over a significant time period should help faculty make wise decisions on curriculum, course content, hiring decisions, etc.

XI STUDENTS

I met with a small group of undergraduate students individually. The students were intellectually impressive and engaging and did not hesitate to give their opinions on any subject. I detected a great sense of pride that these students had in their education. They thought highly of the faculty in the Biology Department and applauded the efforts of the faculty to involve students in research projects. Students really appreciate the fact that faculty are "available" and that most faculty have an "open-door" policy.

The students recognize a problem with the current 105, 106, 107 rotation (107 has time conflicts with other courses). In addition to the recognition of problems with the initial sequence, the only real negative comment that I heard was the "courses were not offered frequently enough." One negative comment dealt with courses listed in the catalog but never offered and one student had a concern over academic advising within the department.

I also think that the students could greatly benefit from a centralized bulletin board(s) that facilitate the flow of information on course offerings, internships, advising, position openings in biology, etc. I also think that a faculty research board (overview of faculty research interests with pictures, etc.) could benefit students and highlight FACULTY/ STUDENT MENTOR RELATIONSHIPS. It would be nice if someone developed a power-point presentation highlighting faculty/student research. This could be a 30 minute overview of what is happening in the life sciences at Mesa State College and should be shown to every freshman general biology class. This could help recruit students to the program (not that the department needs more numbers but they can always benefit by recruiting quality students) and give students already interested in life sciences the "heads-up" on possibilities for independent studies or other research projects down the road.

The students were also highly interested in being able to pursue a masters project at Mesa State College. Because educational opportunities are changing, an undergraduate degree in biology is no longer sufficient for most careers in Biology. Instead advanced training and an advanced degree are required to be competitive in the job market. Mesa State College's Biology department is poised to fill this role (as mentioned above) and the students are eager for this possibility.

XII. SEMINARS

The Biology Department regularly invites speakers to campus to make presentations. During the review, I had the opportunity to attend a seminar on tropical plants and their associations with insects. The seminar was very well attended by both faculty and students. Attracting quality speakers and encouraging faculty and students to attend is a great mechanism for education. The Biology Department should continue its activities and consider offering seminar as a 1 credit hour course to further increase student attendance. Both undergraduate and graduate students need to be exposed to outside speakers and a seminar series is perhaps the best mechanism.

XIII. LIBRARY

I toured the library during the on-site visit. I looked at a list of the journals that the library has in the field of biology and am impressed with the services. Although the journal list could be expanded I believe that progress is being made and the new hire in the library who will work directly with Biology and the other sciences will greatly enhance library services. This is totally inadequate for students or faculty doing even the very basic literature review. I recommend that the Department develop a library committee to address issues of new books, journals, and databases most directly applicable to the department and ultimately develop a proposal that can be given to the Head Librarian.

XV. CONCLUSIONS

Overall, I have a positive view about the Biology Department at Mesa State College. The Biology faculty is well aware of the fact that research and teaching are partners. They understand that research is an important part of their own professional development, their students' education, and the department's curriculum. The department is strong because of good leadership and a very talented faculty that have the students as their top priority.

Busy faculty schedules, lack of adequate space and monies for equipment are major deterrents in the pursuit of excellence by this fine department. A lack of ecological research in the area surrounding Grand Junction and the lack of a MS program limits two areas in which the Department could excel.

I would like to take this opportunity for the entire faculty to consider joining the Council on Undergraduate Research (CUR). This is a wonderful organization that believes that research and teaching are partners and that science can only be learned by doing science.

Finally, I wish you all good luck in your academic pursuits.

