MINUTES OF THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON EDUCATION February 17, 1983

The House Appropriations Subcommittee on Education met at 7:00 a.m. on Thursday, February 17, 1983 in Room 104 of the State Capitol. With Chairman Rep. Esther G. Bengtson presiding, all members were present. The budgets for Montana State University and Montana Tech. were heard.

The budget hearing for Montana State University was opened. Tom Crosser, OBPP, gave his analysis. The formula implemented by the 1981 Legislature was utilized in OBPP's budget formulation. The dollar amounts generated by the formula in the instruction area are 95% of the formula, and 90% in the support area. For MSU, OBPP used enrollment estimates of 10,748 in both years of the 1985 biennium. The Board of Regents estimated 86 more than this. The only modifications in the OBPP budget are those for new space. MSU has one, and Montana Tech has none. Incremental increases off the 1982 actual base were at 6% with some variations; notably, Personal Services was funded at the 1983 level, and Communications was inflated slightly differently to reflect local services and equipment.

Curt Nichols, LFA, stated that the current level approach was to continue the 1981 recommendations. This placed support at 97% and instruction at 100% of peers. The incremental areas were handled similar to the way OBPP handled them. Regarding enrollment projections, he referred the Committee to P. 707 of the LFA Narrative. The LFA is currently reviewing the fall 1982 and Winter 1983 enrollment figures.

Dr. William Tietz, President of Montana State University, then spoke. He gave an overview of MSU, its programs, resources, physical plant, etc. He pointed out that 54% of the former students from MSU reside in the State of Montana. Regarding the MONTS Program and the Agricultural Experiment Station, the research that is conducted has resulted in some new varieties in agriculture. new processes, and new products. He pointed out a number of technical and cultural contributions MSU had made. He pointed out two theatrical groups which MSU had organized: the Treater of Silence and the Shakespeare in the Parks Program. He pointed out that MSU received funds through its Contract and Grant business amounting to about \$16 million per year, which supported a large percentage of its external projects and activities. was distributed which showed where 85% of MSU's enrollment was from; see Exhibit "A." Regarding enrollment, a chart was distributed; see Exhibit "B." Tietz pointed out that MSU had been recording enrollments well above what they had been funded for for a number of years. In the past four years,

MSU had 2,598 students more than the appropriation bill provided for. 433 of that number were funded by supplemental funding. MSU has been under-funded by 25 faculty per year. Three tables were distributed showing the effects of this in three areas; see Exhibit "C." From 1975-6 to 1982-3, MSU's enrollment has grown by 16%. In Engineering, the growth was 95%. Within the College of Engineering, there has been a great increase in the field of computer science. Funding commensurate to actual enrollment would help accommodate enrollment shifts within the disciplines. This kind of situation makes it difficult to accommodate any faculty-related vacancy savings.

Dr. Arch Alexander, head of the Faculty Council, then spoke. The faculty at MSU sees three major problems related to the shortage of funding: (1) inadequate numbers of faculty, (2) inadequate classroom space, and (3) inadequate instructional equipment. The problems are most acute in the areas of engineering and business. He gave examples of how funding shortages had affected the three problem areas. The impact is also felt on advising loads. In Engineering, the student/faculty ratio for advising is 40:1, and the level is similar in Business. Another impact has been in the need to alter instructional methods, to accommodate larger classes, inadequate space, etc. He submitted that in some cases there had to be a denial of education because of these problems, and in other cases the quality of education was damaged.

Mr. Dennis Wagner, a MSU student lobbyist, then spoke. See written testimony Exhibit "D."

Dr. Tietz pointed out that in the area of equipment, MSU had been spending about \$900,000 per year to upgrade the holdings in their library; this had left the entire institution about \$350,000-\$400,000 to take care of administration as well as other kinds of instructional equipment. In addition, the Library has seating capacity for less than 10% of the student population, vs. the recommended level of 35%.

Dr. Tietz then reviewed some of the work done at MSU which had helped accommodate the adverse conditions. Learning laboratories have proven successful. The Writing Across the Curriculum concept has been utilized. The Teaching Learning Committee has been looking at ways in which all diciplines can be taught in new fashions. There were several other efforts: advising workshops have been aimed at developing new advising systems; general education requirements are being reviewed; program evaluations are being conducted; etc.

Dr. Tietz said that although they were in favor of the formula approach to budgeting, it did have some problems. He rose in support of Student Union remodeling, a new Film and Television building, and a new laboratory animal facility, for a total of 132,000 new square feet. (2) Update of the Computer system of \$400,000 in 1984 and \$350,000 in 1985 was approved by the Regents.

Dr. Jerry Wheeler then spoke up regarding the present computer technology at MSU, and related issues. Dr. Wheeler had three points: (1) Many changes are taking place in the computer industry, and in educational technology in parti-If the auto industry increased as much as the computer industry has, in the last 10 years; a Rolls Royce would cost \$3, it would get 3,000,000 miles per gallon, and it would have the power to drive the Queen Elizabeth II across the ocean. He showed the Committee members the microcomputer he owned, and described some of its capabilities. There is also a revolution going on in communications. has had an important impact on the educational institutions (2) Because of the computer revolution, the of Montana. communications development has become much more computer-like. The significance of this is that microcomputers can network across the nation. He displayed a map showing the new telephone lines being installed on the MSU campus, which will put MSU on the verge of networking the entire campus in terms of both communications and computers. This means that future MSU students will have an opportunity to network with MSU's mainframe.

Mike Stoeckig, a sophomore in Computer Science at MSU from Glendive, then spoke. He addressed some of the problems MSU students had regarding computer access. The computer will serve 100 people less quickly than if it had 60 people to service. Students have problems regarding computer availability, and also relating to the amount of time they are allowed to spend on the computer. Students who cannot afford the price of a home terminal are at somewhat of an educational disadvantage to those who can. Someone who owns his or her own home terminal does not need to worry about computer access very much. Because of concerns about computer accessability many students decline to take computer literacy courses which are much needed. MSU's Computer Science curriculum has become seriously overcrowded.

Dr. Tietz then presented the modified request for assistance in developing a Writing Laboratory. MSU has no graduate program in English; therefore, all of their instruction must be conducted by regular faculty members. He submitted that the English faculty was one of the most innovative in the region.

Dr. Stuart Knapp, Academic Vice President for MSU, then A fact sheet about the Writing Skills Center was distributed; see Exhibit "E." In addition, figures showing data were distributed regarding the abilities of other institutions in the region to provide master's degrees in English; see Exhibit "F." In the past five years, MSU has had a very active faculty development program. One outcome has been the Writing Across the Curriculum Project. He described the project, what it would lead to, what was being presently done, and what they would like to do. Increasing freshman English composition enrollments to 60 students per section has enabled the staff to accommodate 88% of the freshman class. MSU has provided the funds for a Director for the Writing Program, at present. Money has been made available for the purchase of microcomputers for the Writing Center, and new space for the writing center has been made available. modification would provide budget for part-time instructors to staff six to eight 60-student sections of freshman writing classes per quarter, and would provide a part-time professional staff for the Writing Center as well as a network of He pointed out that every land grant and student tutors. Western State university except MSU offered a Master's degree in English. MSU is not asking for master's degree authority. The point is: MSU is short-handed. tion to the other institutions having a lower student/faculty ratio they also have graduate teaching assistants available from the Master's programs.

The modified request for continuing funding for the Water Resources Research Center was then addressed. Howard Beattie, acting Water Resources Center Director, spoke. He distributed a summary of the request; see Exhibit "G," and an example of some of the projects being conducted; see Exhibit "H." The only addition to the Water Resources Research Center would be the adding of a Water Information Center. The Water Resources Research Center is a possible link between the water agencies and the Universities. He pointed out that data from water resources agencies are scattered; the modified proposes to collect, analyze, and store the information in a computer bank. He pointed out that the modified only related to surface water; Montana Tech. has a program on ground water data management. Funding for this Center in the past has been through the Department of Interior, but the Office of Water Research and Technology has been disbanded, and the level of funding of about \$100,000 per year is a question. He said he suspected that matching requirements would be increased. He noted that there was widespread support for the Water Resources Research Center from the State agencies for whom they do the research, the

Dept. of Agriculture, the agricultural community, the Farm Bureau, the Dept. of Fish, Wildlife and Parks, the Dept. of Natural Resources, the State Health Dept., Rep. Hal Harper, Rep. Bob Marks, Rep. Dennis Iverson, Sen. Dorothy Eck, the Environmental Quality Council, Sen. Thomas Hager, and Rep. Cal Winslow.

Sen. Thomas Hager, Chairman of the Water Adjudication and Development Oversight Committee, rose in support of the project.

Jo Brunner, Women Involved in Farm Economics, spoke; see written testimony Exhibit "I."

Don Williams, Administrator of the Environmental Sciences Division, Dept. of Health, spoke; see written testimony Exhibit "J."

John Morrison, who had served on the Montana Water Research Center, spoke. He emphasized that the money was well spent and that it did give those involved in engineering and the development of water projects the necessary information to carry on with active projects.

Howard Johnson, Environmental Quality Council, spoke. He pointed out that Reps. Dave Brown and Dennis Iverson had planned to be at the hearing but due to last minute conflicts, he had been asked to appear in their place. EQC has held hearings regarding water resources and water resource problems, and has discussed the Water Center programs with the Center. He stressed the importance of research in Montana at the present. The Council feels that the expertise which exists in the Universities couldn't be matched within State agencies, and is in support of the Water Resource Center.

Dr. Tietz pointed out that unless Montana had the kind of data needed on surface water, it would be in the potential situation of having someone else dictate its water policy.

The <u>hearing on the Montana State University Budget</u> was closed. It was announced that questions would be asked regarding the MSU budget during the Committee's work session.

The Committee took a ten-minute recess.

The hearing on Montana Tech.'s budget was opened. Tom Crosser, OBPP, said the only change regarding Montana Tech. was that the Board of Regents had revised their enrollment estimate to ten students more than the original estimate.

Dr. Fred DeMoney, President of Montana Tech., then spoke. He introduced the staff who were present to assist in the presentation. See written testimony Exhibit "K," bulk testimony file.

Victor Burt, Director of Fiscal Affairs, addressed the issue of indirect cost recoveries. In the past, indirect costs have been about 13% of Montana Tech.'s total revenues; at present they comprise about 8% of the budget. The federal government has refused further coal exploration drilling contracts; this program at Montana Tech. has been generating about \$.5 million per year. Five contracts related to the Federal Title II are being phased out. Geothermal research and water quality research funding are being deemphasized. BLM has cut out all pass-through funds for U.S.G.S. for coal hydrology programs in Montana. It doesn't appear that the MHD Project will be funded in 1984. He pointed out that much of Tech.'s research was related to resource evaluation, and was short-term in nature. Because of this, indirect cost recovery revenues have tended to be inflated to unrealistic levels, and he submitted that the level of \$300,000 would not be realized. They expect that in 1984 the level will be \$105,000-\$110,000.

Regarding scholarships and fellowships, there are two key factors: (1) Tuition increases. This will cause the price of fees and fee waivers to go up. (2) Also, as enrollment goes up, there are more mandatory fee waivers and more students eligible for fee waivers. He submitted that if these factors increased, the level of scholarships needed to be adjusted as well.

Dr. DeMoney expressed the hope that the level of indirect cost revenue relief would be raised from 15% to 30%. However, philosophically and accountability-wise, it should not be there at all in the revenue estimates.

Greg Teets, President of the Associated Students of Montana Tech., then spoke up regarding student fees. He submitted that most students were opposed to tuition increases; the students' plight has worsened as the economy has worsened. Part-time and summer employment job markets are being drastically reduced. Federal student assistance programs are being reduced also. He stated that all the students were asking was that they expected tuition to reflect their needs and the capabilities of their incomes.

Dr. DeMoney then presented Montana Tech.'s two modified requests, which the Regents had approved.

Modified No. 1: Computer Center Academic needs. Jim Michelotti, Director of Montana Tech.'s Computer Services,

spoke. He distributed a handout which contained an overview of Tech.'s computer network; see Exhibit "L." He pointed out that the Bureau of Mines' usage of Tech.'s computer put a heavy burden on it. They have problems with heavy usage, overstaffing, etc., much the same as at the other units of the University system. He submitted that the modified requests were very much a part of their five-year computer plan; see Exhibit "M," bulk testimony file.

Dr. John Marsaglia, Assistant Professor and Coordinator of the Computer Science Program, then spoke. There has been a lot of growth in computer use at Montana Tech. in the recent past. There have been several forces behind this: the inception of the computer science degree program, their new business degree program, which involves a lot of computer science, and the engineering degrees as a whole which are incorporating more and more computing, etc. He distributed a chart showing terminal utilization levels; see Exhibit "N." He submitted that any expansion or productive enhancement to the computer was a direct inducement to Tech: the computer is a critical issue for all departments and disciplines at Tech.

Dr. Ed. Van Eeckhout, Associate Professor of Mining Engineering, then spoke. In the mining industry, computers are used heavily for mine design; in the petroleum industry, they are using the computer in reservoir engineering, geophysics and seismic work: the computer is used heavily at all class levels in Tech.'s Engineering program. He pointed out that Tech.'s peer schools have been able to run the models Tech. began running one year ago, for ten years. He distributed a handout showing examples of where computers were used in their courses as well as research; see Exhibit "O." Mines can be simulated on the computer. They are trying to run engineering problems that are standard ones for the industry and they are having a problem with space and terminal usage.

Kristi Hoklin, a Computer Science student, then spoke. In 1981 when the computer science degree program was approved at Tech., computer usage increased very rapidly and has continued to do so. Students have a hard time getting on the computer not only during daytime hours but at all times.

<u>Dr. DeMoney</u> then discussed <u>Modified No. 2: Instructional Scientific Equipment modification. <u>Dr. Vernon Griffiths</u>, Director of Research at Montana Tech., then spoke. There are a number of reasons why Tech. needed a computerized X-ray diffractometer, not the least of which is for safety reasons. Another item being requested is a testing machine related to an MTS machine. The machine the Engineering and Science Dept. now</u>

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has is not sophisticated enough. The third item being requested is a general purpose power supply which can be used to help melt a variety of metals, etc. In addition, there were several other items being requested.

The Chairman brought up the subject of tuition levels vs. the educational cost per student. Mr. Teets pointed out that if tuition was raised too high, there would be less students. Their position is to make tuition as affordable as possible. Mr. Jeff Morrison, Chairman of the Board of Regents, stated that since 1980 they had raised tuition 60% for in-State students. The Regents passed a 12% increase for 1984 but no increase for 1985.

Dr. Griffiths commented on the effect of indirect costs on organized research. In 1981 the Legislature agreed that the institutions could retain 15% of the indirect cost revenues. This creates an erroneous impression because the Legislature didn't give 15¢ on every dollar. The LFA estimate of indirect cost recovery is higher than what actually comes in. Montana Tech. didn't get any of the 15% of indirect cost revenues because the actual indirect cost revenues were much lower than estimated.

The meeting was adjourned at 10:25 a.m.

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VISITORS' REGISTER

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PLEASE LEAVE PREPARED STATEMENT WITH SECRETARY.

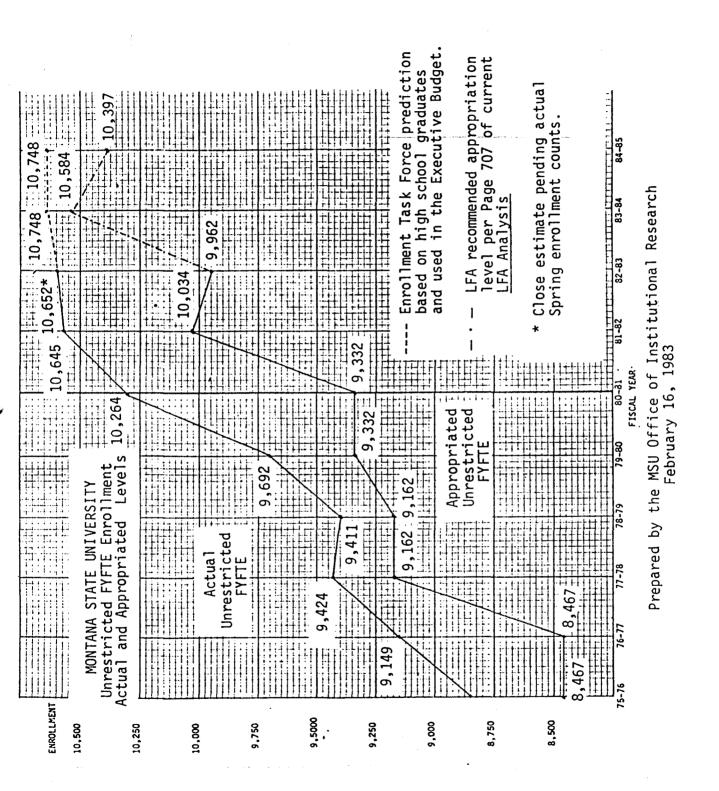
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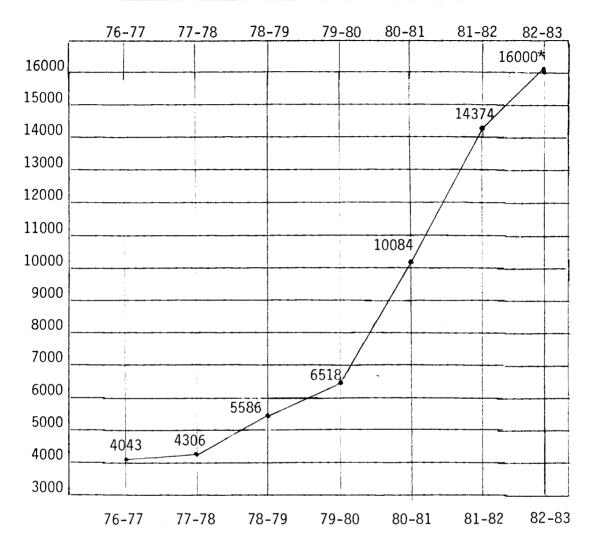
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Montana State University

Computer Science Total Student Credit Hours

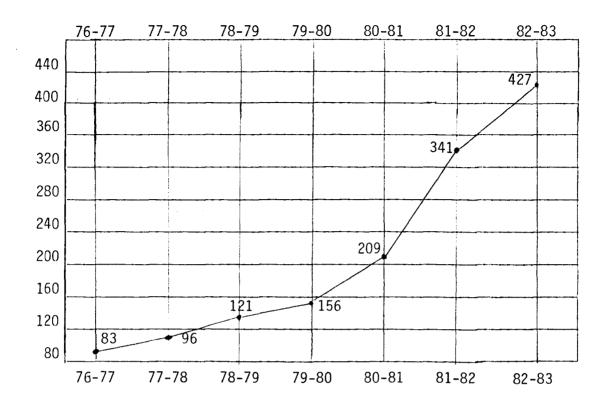


Source: FY SCH Report, Institutional Research Management Reporting System, November 7, 1982.

* Conservative projection, depending upon faculty available to meet student demand.

The increase for this period in Computer Science total student credit hours has been about 300%.

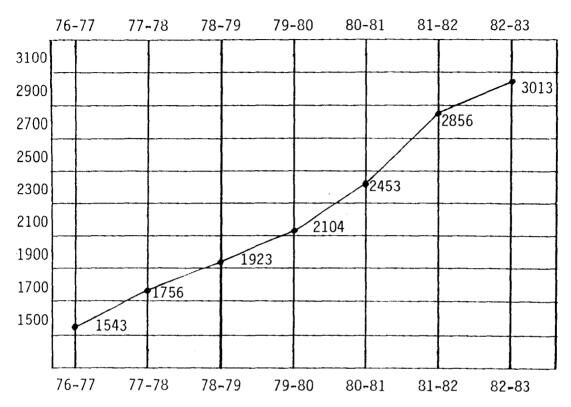
Montana State University Computer Science Majors



Source: Fall Quarter Enrollments by Majors within Depts. Institutional Research Management Reporting System, November 16, 1983.

The increase for this period in Computer Science majors has been 414%.

Montana State University College of Engineering Majors



Source: Fall Quarter Enrollments by Majors within Departments Institutional Research Management Reporting System, November 16, 1982

The increase for this period in the College of Engineering majors has been 95%,



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02/17/83

To the Appropriations subcommittee on Education

Madam Chairman, Committee Members,

My name is Dennis Wagner, and I represent the Associated Students of Montana State University. Students in Montana have been for a long time facing a serious problem that is just now reaching a point where it is possible for remedy - in this committee. That problem deals with the quality of education available to students in the Montana University System. Because of enrollments greater than projected, and formula support factors that simply haven't been adequately funded, students have been forced to compete for a quality education.

For example:

Students must compete for classroom space. In many required courses, students have to go early to obtain seating, or they wind up sitting on steps or leaning against the wall.

Students must compete for the time of their instructors. It is difficult and often impossible for students to get advice on upcoming tests, clarification of points made in a classroom, or the educator's analysis of an idea that was generated in the mind of the student as a result of the coursework. Students in Montana aren't receiving the one-on-one contact with professors that should go hand-in-hand with higher education.

Students must compete for space in our library facility. Students use the library to either research for specific assignments, or as a place to study. Advisors recommend that for every hour a student spends in the classroom, two hours should be spent studying. Consequently, students need a place to study. You may ask, "Why don't they study in their dorm rooms?" Well, when you have an overflow situation that oftentimes forces six students to share each of the study lounges

MONTANA STATE UNIVERSITY, BOZEMAN MT, 59717 406-994-2933



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as living quarters, with every dorm room full - you're bound to generate a little noise. Dormitories, in light of their extremely heavy use, aren't a study facility.

Students must compete for lab space and resource materials. Not long ago I enrolled in a required course, Plant and Soil Science 201, and as a part of our coursework we were to research a specific project and submit a report. In order to have a good, hardcore, hands-on research project, it was recommended that the student do an actual field test on say the affect of nitrogen concentrations on growing corn. However, in the same breath that Dr. Montagne recommended hands-on project work, he also pointed out that due to the limited amount of greenhouse space available, only 15% of the students could be alloted room in the facility. The other 85% of the class was forced to rewrite and rejuvenate old research texts and present a project based upon an experiments performed by others. Very little learning by doing.

Faculty members, in addition to their role as instructors and researchers, also serve as academic advisors. Each student is assigned an academic advisor to help them to choose their curriculum coursework and elective classes in such a manner so as to best equip the student to perform in his/her occupation. My experience with my academic advisor has been very positive - when I have a chance to see him. When I go to see my advisor, I can expect to wait a minimum of 45 minutes, and often up to two hours in return for 15 minutes of his time.

In summary, I would like to point out that while the quality of instructors and instruction is very very high, the availability of that instruction in terms of numbers of faculty and amount of resources is very very low. Students who graduate from one of the six units of the system have to compete in the job market with graduates from schools that have had the close personal contact and resources not



ASMSU

available to our people.

Your support of higher education at this crucial time is most important. I remind you, full funding of the formula is not a level of perfection, it is simply 100% of the average - only the average.

Thank-you

DENNIS WAGNER

MONTANA STATE UNIVERSITY WRITING PROGRAM/WRITING SKILLS CENTER SUMMARY FACT SHEET

I. The problem

- a. MSU is now able to provide a freshman writing course for only half its freshmen
- b. MSU currently has no way to sustain the gains made by the writing-across-the-curriculum program

II. Causes of the problem

- a. Traditional methods of teaching composition have been inefficient because they are too labor-intensive
- b. No graduate program to provide teaching assistants
- c. No line-item budget for part-time faculty to supplement regular faculty in teaching Freshman Writing
- d. Insufficient number of full-time faculty to staff literature major, linguistics, teacher preparation, Freshman Writing, and upper division writing
- e. No writing center to provide support for writing-acrossthe-curriculum and English writing course program

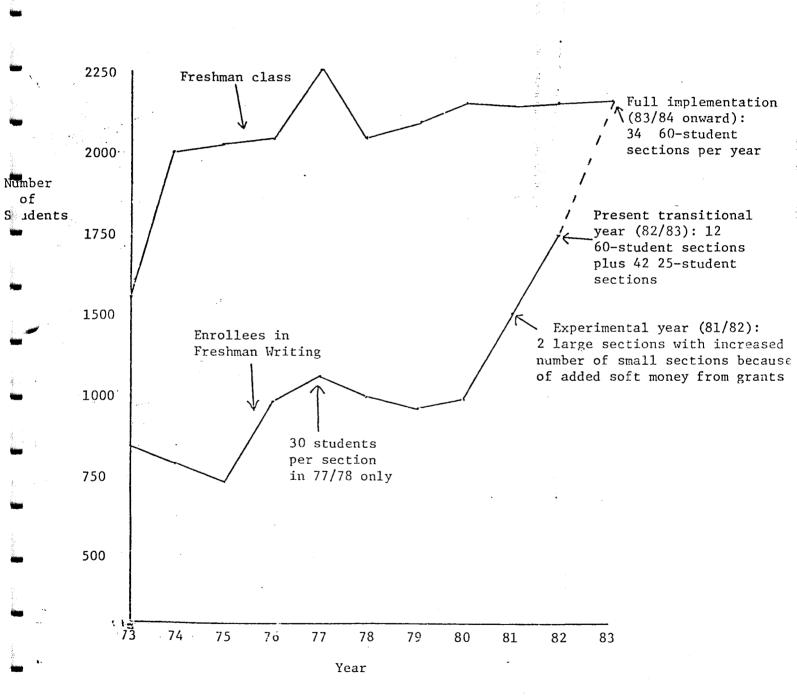
III. Proposed Solutions

- a. Innovative teaching methods to increase efficiency of composition teaching (60-student sections)
- b. Program modification to provide staff for <u>both</u> a Freshman Writing program and a writing center at a cost of only 3 FTE positions
- c. Training of tutors to serve as instructional assistants
- d. Computer-assisted instruction in basic writing skills and reasoning strategies (will be proposed for all students)
- e. Word-processing facilities for selected students
- f. Mini-courses and workshops for students and faculty in all disciplines
- g. Trained individual assistance to instructors in all disciplines for new applications of writing in their courses
- h. Outreach assistance to Montana schools
- Research in teaching of writing and critical thinking; serve as resource center

Figure 1

Montana State University Writing Program/Writing Skills Center

Size of Freshman Class Versus Number of Enrollees in Freshman Writing



Master's Degrees in English at Western State and Land-Grant Universities Fig. 2

		English		M a s	ter.	S D	egree	. T	ы	n g 1.i	s h**		
Name	Undergrad Student Enrollment*	Faculty Student Ratio	Compa- rative Lit	Lin- guis tics	Crea- tive Wrtg	Tchg Eng- lish	Ameri- can Stud.	Eng- lish	Engl 2nd Lang	M.F.A.	M.Ed. in Engl	Eng- lish Lit.	Ameri- can Lit.
Ariz State U				×	×				×			×	×
Colorado St U	15,199	1:337		×	×	×			×			×	×
Idaho State U	5,000	1:208	×									×	
Montana State U	901,6	1:505											
New Mexico St U	17				×	×						×	·×
No Dakota St U								×					
Oregon State U								×					
Portland St U								×					
So.Dak. State U	F 0							×					
Utah State U	10,000	1:357					×	×	×				
Washington St U	1 14,360	1:368					×	×					
U of Alaska						×		×					
U of Arizona								×	×	×	×		
U of Cal/Berkeley	.ey							×				×	×
U of Cal/Davis								×				×	×
U of Colorado					×							×	
U Hawaii/Manoa								×					•
U of Idaho	6,662	1:256				×		×	×				•
U of Montana	6,972	1:332			×	×						×	×
U of New Mexico	0				•			×					11
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Master's Degrees in English at Western State and Land-Grant Universities Fig. 2

		Inglish		Mast	aster's D	edree	s in		English**	* ¥ ₹ ☐ ;		
	Undergrad	Faculty	Compa-	-ui-	Crea- Tichg	Ameri-		Eng1		M.Ed.	Eng-	Ameri-
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u of Utah							×				×	×
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U of Wyoming					×		×		÷			

^{* 1980-81} Enrollment Data

^{**} Institutions reporting a degree in Literature were recorded in both American and English Literature columns

Program Improvement Requests

Montana University System MONTANA STATE UNIVERSITY

Education Subcomm 2/17/83 EXHIBIT "G"

1984

1985

Total

\$130,858

\$128,979

\$259,837

WATER RESOURCES RESEARCH CENTER

Justification:

The decisions that must be made during the 1980s regarding water development and management in Montana will no doubt have impacts reaching into the 1990s and beyond. To help provide the best information and methodology available to decision-makers in both the public and private sector, the Montana Water Resources Research Center (MWRRC) is charged with research, education, and public service programs that address Montana water issues. The principal administrative component of the MWRRC is at Montana State University with campus coordinators at the University of Montana and Montana College of Mineral Science and Technology. The director reports to the Vice President for Research at MSU. Research is contracted to principal investigators at each of the three units.

1. Research. The MWRRC provides research services to state water agencies and cooperates in developing and conducting interagency research programs. Over 130 projects have been completed at the three campuses in such important areas as the quantification of surface and groundwater resources, saline seep, optimum utilization of water for irrigation, quality and quantity of irrigation return flows, and the effects of energy development on water resources, to name but a few. Research projects are selected with the advice of the state water agencies and their progress and results are evaluated by agency personnel.

Through the MWRRC, the high level of expertise at the campuses in such areas as engineering, geology, agriculture, life sciences, economics, and law can be brought to bear on water problems at a fraction of the cost which the agencies would incur if they had to hire this talent on a full-time basis.

- 2. Graduate Education. The MWRRC had identified the training of graduate students in water technology and management as a critical element in Montana's response to water decisions in the 1980s. Over 200 graduate students have participated in past MWRRC projects. Many of these students are now employed by water agencies and the consulting industry in Montana. The MWRRC plays a leading role in coordinating interdisciplinary graduate programs in the water area.
- 3. Public Service. The principal areas of public service are information dissemination and technology transfer. The results of projects at other water resources research centers throughout the nation are available through the MWRRC. The Montana water agencies are notified of the availability of these reports and can request copies. The MWRRC cosponsored the groundwater conference held in Great Falls in April, 1982, and was the principal sponsor of the "Water Issues Facing Montanans" conference held in Helena in December, 1982. The MWRRC also sponsors the water resources simulator, a computerized instructional tool that has received widespread use in conferences and seminars throughout Montana and in other states. The simulator is often used to illustrate options when conflicts arise among water-user groups. Other public services of the Center include the publication of guidelines for small-scale hydroelectric power projects, a cooperative program for testing water quality in wells, and a preliminary analysis of rural water systems to aid communities in seeking assistance.

A new activity proposed by this modification is the development of a surface water resources data management system; ground water data management is the responsibility of the Montana Bureau of Mines and Geology. State and federal water agencies, university personnel, and the private sector have spent considerable resources and effort collecting surface water data in Montana. These data are often fragmented, are not recorded in a standardized manner, are not indexed, and, perhaps most frustrating of all, are not readily accessible through a centralized clearinghouse system. This lack of coordinated management results in loss of time in locating pertinent data and/or in duplication of effort in generating needed data.

The data management system would inventory and index all sources of surface water data available through the state water agencies, make the data available through one centralized clearinghouse, access the validity and completeness of existing data and standardize procedures for collecting future data, and encourage a continuous and intergrated water resources data collection and management program for Montana. Such a system can best be managed by an independent entity such as the MWRRC that operates in cooperation with and for the benefit of all of the water agencies, the private sector, and the public at large.

Montana's commitment to water development as evidenced by SB 409 and other newly enacted and proposed legislation will no doubt give rise to many water management problems. As completition for Montana water grows, the research, education, and public service provided by the MWRRC will assist in developing, preserving, and managing this scarce and valuable resource. This program modification request will provide a stable base from which the MWRRC can operate. Additional funds will be sought by the MWRRC through federal programs to supplement and expand the work of the MWRRC. This commitment of state dollars will provide the matching component required by most federal programs. The budget request for this program modification is detailed below.

BIENNIAL BUDGET RE	QUEST		
<u>Item</u>	1983-84	1984-85	Biennium Total
ADMINISTRATION			
Personnel*			
Director (0.25 FTE)	12,100	13,068	25,168
Campus Coordinator, UM (0.1 FTE)	4,840	5,227	10,067
Campus Coordinator, MCMST (0.1 FTE)	4,840	5,227	10,067
Secretary (0.5 FTE) Total Personnel (1.33 FTE)	$\frac{6,493}{28,273}$	$\frac{7,013}{30,535}$	13,506 58,808
Operations Capital Total Administration Cost	10,400 6,952 45,625	10,832 1,000 42,367	21,232 7,952 87,992
RESEARCH			
Contracted to Principal Investigators Data Management Program Total Research Cost	65,000 20,233 85,233	65,000 21,612 86,612	$\frac{130,000}{41,845}$ $\frac{171,845}{171,845}$
TOTAL BUDGET	130,858	128,979	259,837
*Salary and Benefits			

EXHIBIT "H"

CURRENT RESEARCH (1982-83)

Title of Project	Principal Investigator	Project Coordinated With
Validity of the Wetted Perimeter Methodology for Recommending Instream Flows for Adult Salmonids in Small Streams	Robert G. White (MSU)	Fish, Wildlife & Parks
Chemistry of Montana Snow Precipitation 1982	Gordon K. Pagenkopf (MSU)	DNRC, State Health Dept., Fish, Wildlife & Parks, State Lands
Development of Procedures for Estimating Flow Duration Curves for Ungaged Locations in Moun- tainous and High Plains Regions	Alfred B. Cunningham (MSU)	DNRC
Quantifying Irrigation Return Flows by Time Series Analysis	Richard L. Brustkern and Michael E. Nicklin (MSU)	DNRC
Effects of Urbanization on Physical Habitat for Trout in Streams	Ray J. White (MSU)	Fish, Wildlife & Parks
Land Use and Groundwater Quality in Western Montana: The Impact on Nutrient Budgets for Surface Waters	Jack A. Stanford (UM Biological Station)	Department of Interior, Department of Health & Environmental Sciences
Interaction Between Ground- and Surface-Water Regimes and Mining- Induced Acid Mine Drainage in the Stockett-Sand Coulee Coal Field	Joseph J. Donovan and Thomas J. Osborne (MCMST)	Department of Interior, MCMST, Department of State Lands

PROPOSED RESEARCH

	Title of Project	Principal Investigator	Project Coordinated With
	Evaluation of the Effectiveness of Seismic Shothole Plugging Techniques in the Great Plains Region, Montana	Marvin Miller (MCMST)	Oil & Gas Commission, DNRC
	Evaluation of the Hydrochemical Impact of Flooding a Combined Underground and Open-Pit Copper Mine	Marvin Miller (MCMST)	Department of State Lands, Anaconda Minerals Company
	Ground-Water Availability from the Ancestral Missouri River Channel Aquifer in Northeastern Montana	Marvin Miller (MCMST)	DNRC
Í	Hydrogeologic Controls on Saline- Seep and Water-Quality Problems of the Upper Sage Creek Watershed, Liberty County, Montana	Marvin Miller (MCMST)	DNRC
	Hydrogeologic Aspects and Engi- neering Feasibility of Groundwater Re-Use for Irrigation in the Greenfield Irrigation District, Fairfield, Montana	Marvin Miller (MCMST)	DNRC, Agriculture Dept.
	Prediction and Evaluation of Hydrologic Effects to the North Fork Flathead River Basin Produced by Open-Pit Coal Mining along Cabin Creek, British Columbia	Marvin Miller (MCMST)	DNRC
	Recreation Economics of Montana Water Resources	John Duffield (UM)	Fish, Wildlife & Parks
·	for Reviewing Proposed Small-	Alfred B. Cunningham (MSU)	DNRC, Fish, Wildlife & Parks, Health and Environmental Sciences
	Winter Habitat Requirements of Trout	Robert White (MSU)	Fish, Wildlife & Parks
	Importance of River Side Channels for Meeting Biological Needs of Fish	Robert White (MSU)	Fish, Wildlife & Parks

Title of Project	Principal Investigator	Project Coordinated With
Effects of Fluctuating Flows on Spawning Behavior and Success	Robert White (MSU)	Fish, Wildlife & Parks
Benthal Deposits and Stream Dynamics	W. G. Characklis	DNRC, Health and Environ- mental Sciences
Effects of Oil and Gas Drilling and Production Pit Reclamation on the Groundwater Resources of Northwestern Montana	William W. Woessner (UM)	Water Quality Bureau
Economic Analysis of Alternative Water Development and Use Strategies in the Milk River Basin of Montana	Bruce Beattie (MSU)	DNRC
Economic Analysis of Selling "Surplus" Montana Water (in Storage) for Coal Slurry		DNRC
Economic-Agronomic Modeling of Alternative Irrigation Systems and Strategies for Montana Crops to Achieve Greater Water Use Efficiency and Evaluation of the Aggregate Potential for Water Conserved and Benefits Related Thereto.	Bruce Beattie (MSU)	DNRC
Irrigation Needs in Montana	Larry King	Agriculture Department
Sediment Loading in the North Fork of the Flathead River:	Jack A. Stanford (UM Biological Station)	Forest Service, USGS, National Park Service

Sources, Causes and Consequences

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2/17/83
EXHIBIT "I"

WIFE Women Involved in Farm Economics

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REPRESENT	WOMEN	INVOLVED	IN	FARM	ECONOMICS		
SUPPORT	Х		_01	PPOSE		AMEND	_

COMMENTS:

Mr. Chairman, members of the committee, my name is Jo Brunner and I represent the members of the Women Involved in Farm Economics organization.

W.I.F.E. has participated from their very beginning in water conservation, water use, water development programs. We recognize water as a very essential ingredient in our industry, agriculture, but we realize also its importance to the other segments of Montana economy.

With the increased activity in water development brought about by the passage of SB 409 in the 1981 session and the potential effect of the marketing water, and other bills in this session, we are very supportive of any research programs that will monitor beneficial effects of existing programs and predict the effects of new programs. It is our belief that the water Resource center at MSU has the mechanism in place to do this in a cost effective manner. Thank you.

DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

ENVIRONMENTAL SCIENCES DIVISION



TED SCHWINDEN, GOVERNOR

COGSWELL BUILDING

STATE OF MONTANA

(406) 449-3946

HELENA, MONTANA 59620

February 14, 1983

Representative Esther Bengston Chairman, Subcommittee on Higher Education Montana State Legislature Helena, MT 59620

RE: Regents' modification to include the Water Resource Research Center in Montana State University's budget

Dear Representative Bengston:

Over the past several years the Department of Health and Environmental Sciences and the Water Resource Research Center at Montana State University have had a relationship that I believe has been mutually beneficial. A representative from our Water Quality Bureau has been a member of their advisory council and has helped plan their activities and prioritize their research projects.

In turn, the Water Center has arranged for university faculty to conduct research projects that have been helpful to us in our water quality programs. Examples include projects establishing better techniques for measuring bacterial and chemical water contaminants, operation of wastewater lagoons, and the potential for groundwater pollution from sub-surface disposal of wastewater. These projects have been conducted at minimal cost to the Department.

Research is not a line item in the Department's budget and the availability of Departmental staff to do research is minimal. We are particularly interested, therefore, in seeing the kind of services provided by the Water Resource Research Center continued.

The data management unit of their proposed budget is also of interest to us. The availability of water information in one centralized location, screened for accuracy and reliability, would facilitate administration of our program.

Thank you for your consideration in this matter.

Sincerely yours,

Donald G. Willems

1) mill of Willems

Administrator

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ED. SUBC HEARING AGENDA 2/17/83

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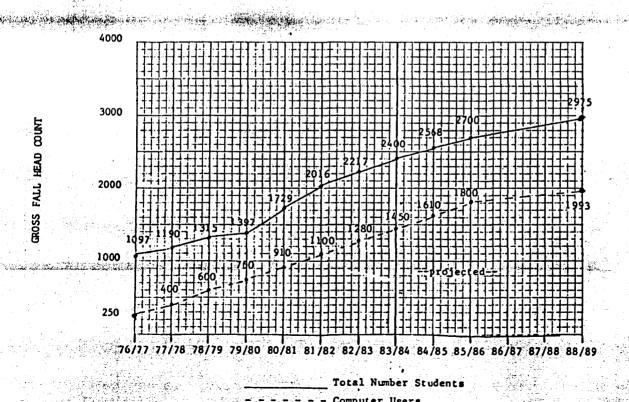
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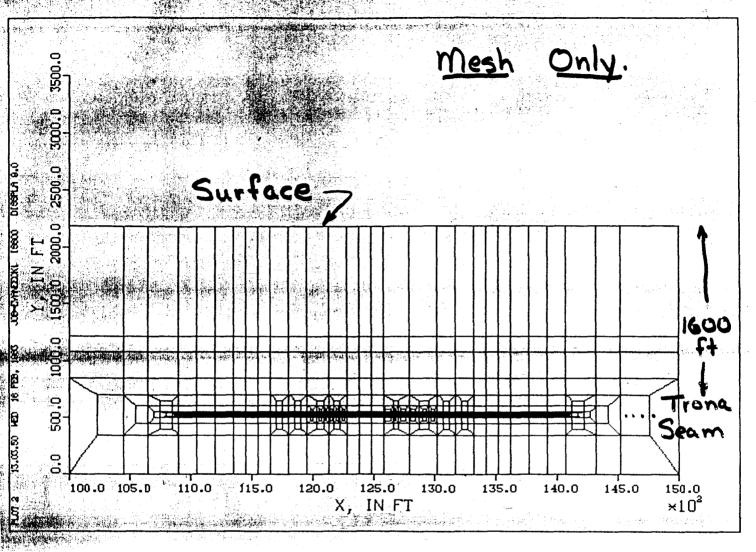


Fig. 1: Typical stress and subsidence modeling problem. Particular situation is soda ash mine in Green River, Wyoming.

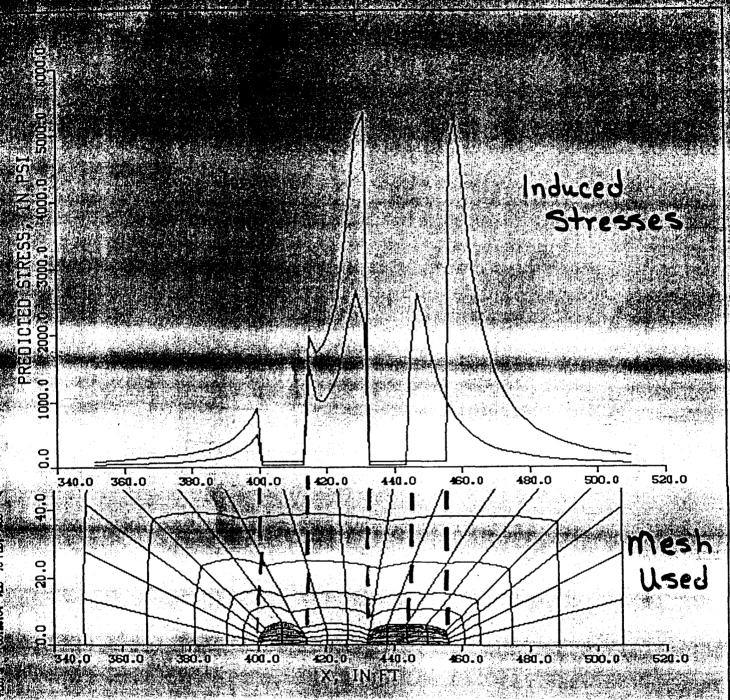


Fig. 2: Typical approblem involving instress concertations around openings (shaded portions). Posticular situation is shrew makes from Coverid Alena Mix District of Idalo.