

**The Northeast Louisiana
Science, Technology, Engineering, and Mathematics Talent Expansion Program
(The NLA STEP Program)**

Overview of the Project

Goal

To increase the number of students pursuing and receiving associate and baccalaureate degrees in established or emerging fields within science, technology, engineering, and mathematics (STEM) in Louisiana, especially in the northeastern portion of the State.

Objectives

1. To increase the number of traditionally underrepresented students (low income, rural, black, female) in STEM
2. To create a bridge program that provides additional preparation for students otherwise not fully prepared to succeed in STEM
3. To facilitate student exposure to potential careers with co-op jobs and internships with industry and government during the school year
4. To encourage undergraduate research on and off campus

Program Components

The NLA STEP Program will consist of two primary components:

1. A bridge program focused on:
 - Recruiting traditionally underrepresented students (low income, rural, black, female)
 - Providing additional preparation for students otherwise not fully prepared to succeed in STEM
 - Providing a 4-week summer program that would bring 30 high school students to the ULM campus to work with faculty from LDCC and ULM
 - Ensuring a successful transition from high school to community college to university
2. A mentoring program focused on:
 - Retaining students from freshmen to graduation
 - Facilitating student exposure to potential careers with co-op jobs and internships with industry and government during the school year
 - Encouraging undergraduate research on and off campus
 - Ensuring a successful transition from university to graduate school or work

Significance of the Project

For years researchers have been writing about the low numbers of women and underrepresented minorities in STEM careers and suggesting strategies for solving this problem (1,2,3,4,5,6,7,8,9,10,11,12). The University of Louisiana at Monroe (ULM), in partnership with the Louisiana Delta Community College (LDCC), will incorporate many of these strategies in a pilot project designed to improve the recruitment and retention of low-income, academically capable but under-prepared students, especially female and black students, in STEM majors.

ULM and LDCC are located in the northeast sector of Louisiana, an area which is predominantly rural and where economic activity has traditionally been based on agriculture. The institutions' service area extends into Southeast Arkansas and the Mississippi River's delta region, which are also characterized by low-income, predominantly rural communities. This region is largely populated by people that traditionally have been underrepresented in STEM programs (i.e., low income, rural, black, female).

It is widely accepted that further economic development in the region can only occur with an educated labor force. Although statewide initiatives such as an accountability program for K-12 education and the Louisiana Tuition Opportunity Program for Students (TOPS) program for higher education should have positive long-term effects, special initiatives are needed to address the acute need for graduates in STEM fields.

By attracting students into the STEM fields and improving their chances for academic success, this project could significantly raise the number of graduates in STEM fields and contribute to the region's economic development. The successful placement of graduates in industry and government has the added positive effect of encouraging current and prospective students to pursue similar careers, thus increasing the project's long-term effects.

Overview of the Institutional Partners

The University of Louisiana at Monroe

ULM is a selective admissions, state-funded institution of higher education which offers both undergraduate and graduate academic programs. ULM is committed to serving as a gateway to diverse academic studies for citizens living in the urban and rural regions of the Lower Mississippi Delta. ULM offers a broad array of academic and professional programs through the doctoral degree, including the state's only public Doctor of Pharmacy program. Complemented by research and service, these programs address the post-secondary educational needs of the area's citizens, business and industry. The University ensures student learning by promoting a comprehensive context for the intellectual, scientific, cultural, technological, and economic development of a diverse student and faculty population. ULM values the continued development of mutually beneficial partnerships involving school, governmental, business, and a variety of community-based agencies.

ULM has followed a course of vigorous growth in its transition from a junior college to an institution offering a comprehensive range of undergraduate and graduate degree programs. In September 1931, the University opened for its first session as Ouachita Parish Junior College, which was operated as part of the Ouachita Parish School System. In 1934, Louisiana State University received authority from the State Legislature to operate the facilities of the University as Northeast Center of Louisiana State University. The name of the institution was changed to Northeast Junior College of Louisiana State University in 1939. The following year, the State Legislature authorized the transfer of all lands connected with Northeast Junior College to Louisiana State University.

The 1950 Legislature approved the expansion of Northeast Junior College to a senior college granting academic degrees. The name of the institution was changed to Northeast Louisiana State College, and its control was transferred from the Louisiana State University Board of Supervisors to the State Board of Education. The academic year 1969-70 was a milestone for ULM; in addition to awarding the first doctoral degrees, the name was changed to Northeast Louisiana University by the 1970 Legislature. The constitution, which was adopted by the people of Louisiana in 1974, provided that the administration of state colleges and universities be changed from the Louisiana State Board of Education to the Board of Trustees for State Colleges and Universities effective May, 1975. This Board's name was again changed on June 8, 1995 to the University of Louisiana Board of Trustees and in 1998 to the University of Louisiana System Board of Supervisors. On August 27, 1999, the University officially changed its name to The University of Louisiana at Monroe.

It is the intent of The University of Louisiana at Monroe that awareness of individual and group rights according to sex, race, color, creed, national origin, and physical or mental disability be regarded as important to the education of its students. The University does not permit any actions, including verbal or written statements that discriminate against an individual or group on the basis of sex, race, color, creed, national origin, or physical or mental disability.

Louisiana Delta Community College

LDCC was created by the Louisiana Legislature in 1997. The institution is managed by the Louisiana Community and Technical College System. LDCC held its inaugural semester of courses in fall 2001. The initial semester saw the offering of courses in Bastrop, Lake Providence, Tallulah, West Monroe, and Winnsboro.

The mission of LDCC is to offer quality instruction and services to the student of Northeast Louisiana, by offering courses and programs that provide sound academic education, broad-based vocational and career training, continuing education, and various community and outreach services. These programs are provided in a challenging, wholesome, ethical and intellectually stimulating setting. Students are encouraged to develop their academic, vocational and career skills to their highest level to successfully compete in this rapidly changing and increasingly technology-based society.

LDCC has an open admissions policy. LDCC assures equal opportunity for all applicants without regard to race, color, religion, sex, national origin, age, or disability.

Demographic Information

Northeastern Louisiana is primarily rural, with the cities of Monroe and West Monroe constituting the largest metropolitan area in the 12-parish region. As Table 1 indicates, this region is populated by a significant number of people from groups that are underrepresented in STEM areas. For example, a greater proportion of residents in the project area subsist below the poverty level (27.3%) compared to the national average of 13.3%. A greater proportion of the project area's people are from minority ethnic groups (approximately 38%) compared to the rest of the nation (approximately 24%). Furthermore, a majority of the area's students who enter institutions of higher education require developmental courses and, therefore, are under-prepared for the rigors of STEM curricula, especially those programs that require a strong background in mathematics. Thus, this project is ideally situated to target substantial numbers of people who traditionally have been underrepresented in STEM programs.

Table 2 shows ULM and LDCC demographic information that clearly reflects the need to help these groups and to increase the avenues by which rural, minority, and female students enter and are retained in STEM degree programs. Currently, only 6 to 7% of the students at either institution enroll in STEM areas, and only approximately 5% of undergraduates completing their programs do so in these areas. Furthermore, white STEM majors outnumber minority STEM majors by nearly 3:1, and the number of white STEM graduates is more than five times the number of minority STEM graduates. Not surprisingly, fewer females enroll in and complete STEM programs than males; however, it does appear that this difference is diminishing over time.

Table 1. State and regional demographic information for 2000 (from www.census.gov, www.doe.state.la.us, and www.ldol.state.us).

	Louisiana	Project Target Area*
Total Population	4,468,976	353,685
Median Income (\$)	30,466	25,059
Population Under Poverty Level (%)	18.4	27.3
Unemployment Rate (%)	5.7	8.7
Ethnicity (%)		
Black	32.5	34.0
American Indian	0.6	0.2
Asian	1.2	0.5
Hispanic	2.4	0.2
White	63.9	62.0
Students Entering College (%)	44.8	35.2
Students Requiring Developmental Studies (%)	37.4	53.0

*Includes the following parishes: Caldwell, East Carroll, Franklin, Jackson, Lincoln, Madison, Morehouse, Ouachita, Richland, Tensas, Union, and West Carroll.

Table 2. Demographic information for The University of Louisiana at Monroe (ULM) and the Louisiana Delta Community College (LDCC).

	ULM			% of ULM Undergraduate Total			LDCC	% of LDCC Total
	1999	2000	2001	1999	2000	2001	2001	2001
Fall Undergrad. Enrollment (FTE*)	9,650	9,403	8,666		91.8	91.6	135	100.0
Fall Undergrad. STEM Enrollment	597	550	448	6.7	6.6	5.7	10	7.4
Male								
All	320	309	240	3.6	3.7	3.1	4	3.0
Black	54	58	42	0.6	0.7	0.5	1	0.1
American Indian	3	1	3	< 0.1	< 0.1	< 0.1	0	0.0
Asian	18	9	9	0.2	0.1	0.1	0	0.0
Hispanic	5	4	2	0.1	< 0.1	< 0.1	0	0.0
White	240	237	184	2.7	2.9	2.4	3	2.2
Female								
All	277	241	208	3.1	2.9	2.7	6	4.4
Black	86	76	60	1.0	0.9	0.8	4	3.0
American Indian	0	1	0	0.0	< 0.1	0.0	0	0.0
Asian	11	4	5	0.1	< 0.1	0.1	0	0.0
Hispanic	4	2	1	< 0.1	< 0.1	< 0.1	0	0.0
White	176	172	142	2.0	2.1	1.8	2	1.5
AY Undergrad. STEM Degrees Conferred	58	65	65	4.4	5.1	5.0	0	0.0
Male								
All	36	38	34	2.7	3.0	2.6	0	0.0
Black	0	1	3	0.0	0.1	0.2	0	0.0
American Indian	0	0	0	0.0	0.0	0.0	0	0.0
Asian	3	2	2	0.2	0.2	0.2	0	0.0
Hispanic	0	1	0	0.0	0.1	0.0	0	0.0
White	33	34	29	2.5	2.7	2.2	0	0.0
Female								
All	22	27	31	1.7	2.1	2.4	0	0.0
Black	2	5	7	0.2	0.4	0.5	0	0.0

American Indian	0	0	0	0.0	0.0	0.0	0	0.0
Asian	0	2	0	0.0	0.2	0.0	0	0.0
Hispanic	0	0	0	0.0	0.0	0.0	0	0.0
White	20	20	24	1.5	1.6	1.8	0	0.0

*Computed as undergraduate Student Credit Hours divided by 12 and graduate Student Credit Hours divided by 9. Percentages are referenced to institution totals.

Bridge Program Activities

Disciplinary Focused Activities

The Bridge Program will consist of three four-week summer sessions with follow-up activities during the following school year. Thirty high school students (10 rising sophomores, 10 rising juniors, and 10 rising seniors) will be recruited for each summer session. Students who successfully complete a developmental course will earn dual high school and college credits for their Bridge Program course work. During the four-week summer sessions, the participants will live on campus during the week and return home on the weekend. Three undergraduate STEM majors will live on campus with them. Special informational sessions for parents and students will be held on Sunday afternoons. Parents and teachers of participants will be invited to a research symposium on the last Friday of the summer session so that the high school students can present the results of their research projects.

Morning activities will be focused on college readiness activities in mathematics, language arts, and study skills. LDCC faculty will lead these sessions with assistance from Dr. Eaton and Ms. Green. The students will be divided into groups according to their skill levels for these activities. These development activities are described more fully below.

Afternoon activities will be focused on research projects and computer skills. ULM faculty will lead the research projects. For two hours each afternoon of the first week, participants will be introduced to the topics for the research projects. At the end of the first week, the participants will be asked to indicate first and second choice preferences for research projects. The thirty participants will be divided into six groups of five and assigned to one of the research project leaders. For two hours each day of the remaining three weeks of the program, the participants will work in their research groups. Each of research project leaders will lead two research groups. Each of the undergraduate assistants will be assigned to one of the research project leaders. Research project leaders will discuss research methodology, ethical issues, and career opportunities with the group; help the group design and implement the project; supervise the students when they are working on the project; and require both written and oral reports on the group projects at the end of the summer session.

In the computer lab, the students will be introduced to MicroWorlds, web page creation, and Microsoft Office. Because of its powerful graphics capabilities, MicroWorlds is a useful tool for introducing computer programming to students who might be reluctant to learn programming. In addition, it is easy to add MicroWorlds projects to web pages. Microsoft Office is commonly used business software that includes a word processor (Word), a spreadsheet (Excel), and a presentation tool (PowerPoint). The participants will use Word to write their research papers and to create a newspaper that will be published at the end of the four-week session. They will use Excel to analyze the data from their research projects. They will use PowerPoint to create their presentations for the research symposium.

One day each week, the participants will go on a field trip to learn about STEM careers. Each field trip will include a presentation of STEM concepts implemented at the facility. A guided tour will be an integral component of the program. Field trips will include four of the following facilities:

- a. Louisiana Delta Community College
- b. U. S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi (70 mile trip). This is a sophisticated research lab, which makes extensive use of mathematical and physical models.
- c. Black Bayou National Wildlife Refuge
- d. Paper Mill (Riverwood International USA, Inc.
- e. Engineering Firm (Ford, Bacon & Davis)
- f. Public Utility (Louisiana Power and Light)
- g. Telecommunications Company (CenturyTel)

Throughout each four-week summer session, the participants will attend evening seminars that will offer an opportunity for local professionals to present their disciplines to the group, discuss background and education needed for success in that particular field, and address the ethical issues pertinent to their fields. These evening activities will allow students to interact with outstanding scientists in the community on such topics as educational requirements, career opportunities, and ethical considerations in various scientific and technological fields. Following speakers' remarks and informational sessions, participants will engage in question and answer periods to gain insight into areas of special interest. Whenever possible, the speakers will be females, minorities, and/or scientists with disabilities. To foster interaction between speakers and students, the evening guests will be invited to

eat with participants as frequently as their schedules will allow. A list of guest speakers is at the end of the daily schedule of activities.

When the students are not under the supervision of the project staff, they will be under the supervision of the three undergraduate assistants who will serve as residence counselors and will live in the dormitory with them. They will supervise a variety of non-academic activities such as swimming, canoeing, basketball, volleyball, and bowling. The counselors will immediately notify the project directors of any problems that occur.

Daily Schedule

Weeks 1-3	Sunday	Monday-Thursday	Friday
9:00 - 10:30 a.m.		Math	Field Trip 9:00 to 12:00
10:30 - 12:00 noon		English	
12:00 - 1:00 p.m.		Lunch	Lunch
1:00 - 3:00 p.m.		Research Projects	Research Projects
3:00 - 5:00 p.m.	Parent Session	Computer Lab	Go home for weekend.
5:00 - 7:00 p.m.	Dinner & Free Time	Dinner & Free Time	
7:00 - 8:30 p.m.	Computer Lab	Evening Program	
8:30 - 10:00 p.m.	Study Time	Study Time	

Week 4

Sunday	
3:00 - 5:00 p.m.	Informational Session for Parents
5:00 - 7:00 p.m.	Dinner & Free Time
7:00 - 8:30 p.m.	Computer Lab
8:30 - 10:00 p.m.	Study Time
Monday	Field trip, Waterways Experiment Station, Two hours with research projects
Tuesday/Wednesday	
9:00 - 10:30 a.m.	Math
10:30 - 12:00 noon	English
12:00 - 1:00 p.m.	Lunch
1:00 - 3:00 p.m.	Research Projects
3:00 - 5:00 p.m.	Computer Lab
5:00 - 7:00 p.m.	Dinner & Free Time
7:00 - 8:30 p.m.	Evening Program
8:30 - 10:00 p.m.	Study Time
Thursday	
9:00 - 10:30 a.m.	Math
10:30 - 12:00 noon	English
12:00 - 1:00 p.m.	Lunch
1:00 - 3:00 p.m.	Research Projects
3:00 - 5:00 p.m.	Computer Lab
5:00 - 7:00 p.m.	Dinner & Free Time
7:00 - 10:00 p.m.	Farewell Party
Friday	
8:00 - 12:00 noon	Research Symposium (Parents/teachers invited)
12:00 - 1:00 p.m.	Lunch
1:00 - 5:00 p.m.	Check-out

List of Evening Speakers and Topics

- a. Academic Success, Ms. Betsy Huey & Mr. Carlos Morris
- b. Careers in Agriculture, Mrs. Patty Watts
- c. Careers in Aviation, Dr. Sally Davidson
- d. Careers in Biology, Dr. Kim Tolson
- e. Careers in Chemistry, Dr. Sharon Cruse
- f. Communication Skills, Mr. Ron Tangye
- g. Careers in Computer Science, Dr. Virginia Eaton

- h. Careers in Engineering, Dr. Lynn Kreider
- i. Careers in Geosciences, Dr. Mervin Kontrovitz
- j. Careers in Mathematics, Dr. Annela Kelly
- k. Careers in Nursing, Ms. Florencetta Gibson
- l. Nutrition, Dr. Rene' Jackson
- m. Personal Success, Dr. Pamela Saulsberry
- n. Careers in Physics, Ms. Dianne Bruscato
- o. Careers in Teaching, Dr. Peggy Jelks
- p. Careers in Toxicology, Dr. Annette Ship

Developmental Activities

During the recruitment process, all students will be given the ACT Compass test. The ACT Compass test is a computerized diagnostic and placement tool that determines students' abilities in reading, writing, and mathematics. The Compass placement measures are designed to assist the institution in placing students into appropriate "standard" level courses or into developmental or preparation courses, as appropriate. The ACT Compass test's placement parameters can be tailored to age-appropriate levels. Each discipline of the ACT Compass includes diagnostic sub-categories. These sub-categories further pinpoint strengths and weaknesses specifically for each student. These sub-categories are outlined below.

Diagnostic scores can be generated in the area of numerical skills and pre-algebra in the following areas:

- Operations with integers
- Operations with fractions
- Operations with decimals
- Exponents, square roots, and scientific notation
- Ratios and proportions
- Percentages
- Averages (means, medians, and modes)

If these skills are diagnosed as being non-mastered, the student will be placed in Math 095.

Diagnostic scores can be generated in algebra in the following areas:

- Substituting values
- Setting up equations
- Basic operations with polynomials
- Factoring polynomials
- Linear equations with one variable
- Exponents and radicals
- Rational expressions
- Linear equations with two variables

If the student has mastered the area of numerical skills but is diagnosed as having not mastered these algebra skills, the student will be placed in Math 099.

The mathematics placement not only can measure diagnoses in the areas of numerical skills/ pre-algebra and algebra but also in college algebra, geometry, and trigonometry.

The writing skills diagnostic are based on the following areas:

- Punctuation
- Verb formation and agreement
- Usage
- Relationships of clauses
- Shifts in construction
- Organization
- Spelling
- Capitalization

The student is placed into an English level based on their Compass writing skills placement score. The scores are as follows:

- 0-37 English 095
- 38-69 English 099
- 70-100 Adequately prepared for freshman college-level English

Upon completion of the ACT Compass test, results from the test will be used to place the students in the appropriate developmental courses. The students will be placed in one of two levels of Mathematics and English

developmental courses. Students placed in the first level of English (English 095) will also be taught developmental reading skills. The ACT Compass test will be utilized two weeks into the courses and upon completion of the courses to determine progress. The Compass test given two weeks into the course should reflect the students' satisfactory proficiency in the content areas, which have already been presented by the instructor.

The two levels of English courses that will be taught are referred to as English 095 and English 099. English 095 is an introductory course in grammar and composition designed to help students gain greater proficiency in basic writing skills and thus prepare them for English 099. Upon successful completion, students will be able to write effective sentences and paragraphs, which conform to the conventions of standard American English. This course will also include developmental reading skills. Emphasis will be placed on the development of study skills, vocabulary, and comprehension.

English 099 is a developmental course in grammar and composition and is designed to prepare students for college level freshman English. Upon successful completion of this course, students will be able to write clear, adequately developed, logically organized, effective paragraphs and essays which conform to the conventions of standard American English.

The two levels of Mathematics course that will be taught are referred to as Math 095 and Math 099. Math 095 is an introductory course in basic mathematics. Instruction and practice is provided in both computation and application problems involving whole numbers, fractions, decimals, percents, proportions, integers, exponents, and scientific notation. Upon successful completion of this course, students will be able to accurately perform basic mathematical concepts and thus be prepared for Math 099.

Math 099 is a developmental course combining the key elements of beginning and intermediate algebra. Topics include arithmetic operations with real numbers, algebra fundamentals through operations with polynomials and rational expressions, solving linear equations, solving quadratic equations by factoring, solving inequalities, and simplifying radicals. Upon successful completion of this course, students will have obtained the necessary skills to be successful in a beginning college-level algebra course.

The developmental classes will be taught by Dr. Eaton, Ms. Green, and qualified LDCC faculty members with a minimum of a Masters degree and teaching experience within the developmental field. The mathematics courses will be held from 8:30am to 10:00am, Monday through Thursday. The English courses will be held from 10:15am until 11:45am Monday thru Thursday. Additional emphasis on course content will be carried over into the field trips as well as the afternoon research projects and computer classes.

The student should successfully complete the developmental level courses and be prepared for freshman college level mathematics and English courses by the end of the third summer of the Bridge Program. Students will receive dual high school and community college credit for successful completion of the developmental courses. If any of the students complete the necessary developmental course work in the first one or two summers, they will be allowed to take a freshman level class in mathematics, science, English, or computer science for college credit.

Activities Focused on Research Methodology

The research group leaders will ensure that students actively participate in the discovery of knowledge by exploring literature and experimenting in the labs as they work on group projects, discuss methods and techniques of scientific research, and address ethical issues. All research projects will involve computer applications. Projects will include hands-on collection, assembly and analysis of data in varied scientific areas. Students will maintain portfolios of their work and daily journals. Two groups of five students will participate in each of the following projects. A student who participates in all three summers will complete all three projects. The results of the projects will be presented at a research symposium at the end of the four-week summer session. Each student will participate in the write-up phase and the presentation of his/her group research project.

(1) Design and Testing of an Expert System Dr. Virginia Eaton

Concepts from the area of artificial intelligence will be investigated in a research project focussed on artificial intelligence and expert systems. Students will be taught the method of expert systems development consisting of domain selection, knowledge acquisition, prototype development, system development, testing, and documentation.

As part of the domain selection phase, the students will discuss the pros and cons of various potential application areas and then choose one area as the basis for further investigation. Next, techniques for knowledge acquisition will be presented. Then the students will utilize several approaches to acquire a foundation of domain knowledge. The students will develop prototypes using PROLOG. After testing and refining the original prototypes, the students will then test and complete documentation of their work.

The primary objectives of this project are to familiarize the students with a class of computer problem that is non-numeric and to present a step-by-step method of system development. Each research group will develop its own expert system.

(2) Mathematics of Simple Games

Dr. Annela Kelly

Mathematical concepts will be investigated in a research project focussed on game theory. Students will investigate the mathematical aspects of several well-known games. Students will be taught mathematical concepts required for the study. These concepts include binary numbers, modulus arithmetic and isomorphism.

Students will first investigate the tic-tac-toe game and its strategies. Then they will look at the game of "HOT". In this game, each of the following words is printed on a card FORM, HEAR, TIED, WASP, BRIM, TANK, SHIP, WOES, HOT. All the cards are placed face up on the table. At each turn, a player picks a card. The first to hold three cards that contain the same letter is the winner. The students will play the game enough times to be able to form the hypothesis that the game "HOT" is the same as the game of tic-tac-toe. Next, the group will work on proving the hypothesis. Afterwards, as a project, the students will create a word game of their own which has the same rules as the game "HOT".

The primary objective of this project to introduce the students to very engaging, but not widely known mathematical ideas in variety of simple games. These ideas are easily accessible to high school students. Each students will learn the mathematical background and then each research group will create its own game.

(3) Explorations into the Growth and Foraging Behavior of Fishes

Dr. Peter Aku and Ms. Tiffany Green

Through field and laboratory investigations of fish, their otoliths, and prey selectivity, students will examine how growth and foraging strategies among fishes may be influenced by both biotic and abiotic parameters of their environment. A hands-on approach will be utilized so that skills essential for conducting scientific research are emphasized. Students will also investigate and describe the interdisciplinary use of otoliths in other areas such as paleontology, isotope geology, archeology, and wildlife conservation/management. The diversity of fishes in Louisiana will also be explored.

Instructional methods will include field activities, advance organizers, laboratory investigations, demonstrations, small group activities with cooperative learning, concept mapping, lecture with group discussion, hands-on activities, and problem solving. Through the use of these methods, the student will be able to

- Identify essential abiotic and biotic factors, which affect physiology and growth.
- Understand essential concepts related to the formation, function, growth, and value of fish otoliths.
- Identify foraging adaptations and strategies.
- Understand prey selectivity.
- Comprehend the tremendous diversity of freshwater, estuarine, and saltwater fishes in Louisiana.

The primary objective of this project is to familiarize students with the strong connection between science, technology, and society. Students will become more aware of the relationship between the region's tradition of recreational and commercial harvesting of wild fish stocks, the multi-million dollar catfish farming industry in the Delta, and ULM's research activities utilizing fish otoliths at nearby nationally recognized mound sites, Poverty Point and Watson's Brake. Each research group will design its own fish project.

Activities for Parents

On the first Sunday that parents bring participants to ULM they will be given a tour of the campus with their children so that they will have a better idea of where their children will be living for the next four weeks. For most parents the tour will also give them a better idea of what a college campus is like. On the second Sunday, parents will be invited to tour the LDCC campus with their children and to participate with them in a session presented by the Student Services Office of LDCC. This session will be devoted to a discussion of required high school courses, entrance requirements, scholarships, grants, and other financial aid opportunities. On the third Sunday, they will be invited to a session presented by the Placement Office of ULM. This session will be devoted to a discussion of career opportunities in STEM. On the fourth Sunday, they will be invited to a session presented by the CASS Office. This session will be devoted to a discussion of techniques for achieving academic success. Finally, parents will be invited to the research symposium at which their children will be presenting the results of their research projects.

Follow-up Activities

The participants will be required to develop their research project work into an entry for their school's science fair. They will be given copies of the rules for the International Science and Engineering Fair which will be referenced by the research project advisers as they teach about research methodology and ethical issues in research.

At the end of the four-week session, participants will be asked to propose a science fair project related to their research topics. Participants will be required to enter projects in their local school science fairs. Schools in Northeast Louisiana hold their local science fairs in February and March. Winners progress to the Regional Science Fair, which is hosted by The University of Louisiana at Monroe. Dr. Eaton has worked closely with the Regional Science Fair since 1989 and is very familiar with the rules and regulations. Dr. Eaton anticipates that all of the projects will be good enough to be entered in the Regional Science Fair and that several will be good enough to be entered in the State Science Fair. During the fall, the participants will return to LDCC for two Saturdays to work on their science fair projects with the project directors. They will return to ULM in January for a final visit prior to their local science fairs.

In addition to the three Saturdays on campus, the project directors will maintain contact with participants via e-mail and the project web site. The undergraduate counselors and other STEM alumni will serve as "Big Brothers/Sisters" for the participants. They will use e-mail and the web site to provide on-line mentoring for the participants throughout their high school careers.

Participants, who are in their senior year of high school, may elect to take one college course at LDCC during the fall and the spring. Tuition and fees will be paid for them.

Recruitment and Selection of Students for the Bridge Program

Participants will be recruited from public and private high schools in Northeast Louisiana. Recruitment will begin in January of each year. Recruitment will be conducted via mail, on-site visits, and the project web site. Criteria for student selection for participation in the Bridge Program will initially be a recommendation from a student's school principal. Once recommendations have been made, all of the recommended students will be tested using the ACT Compass test. In addition to the questions related to English and mathematics skills, an interest survey will be added to the ACT Compass test. The interest survey will be used to determine which students have interests that could lead to an interest in a STEM field. The ACT Compass test can be loaded onto computers at the students' schools and utilized at any time. Results are instantaneous upon test completion. Students who are placed into developmental levels of English and mathematics meet the academic criteria for the Bridge Program. Refer to the previous section, "Developmental Activities", for a breakdown of skills assessment and scoring methods.

Students will be chosen for the Bridge Program according to the following criteria:

- A student must be recommended by his/her high school principal.
- A student must be academically eligible (i.e. scores on the ACT Compass test).
- A student must indicate an interest in a STEM field or interests that are related to STEM fields (i.e. scores on the interest survey part of the ACT Compass Test)
- A student must agree to participate in both the summer program and the follow-up activities.

All of the PIs will participate in the recruitment and selection of participants. Special consideration will be given to women, underrepresented minorities, and the physically challenged.

Mentoring Program Activities

The Mentoring Program will be open to all STEM majors. One major focus of the Mentoring Program will be the retention of students, especially women and underrepresented minorities, until graduation. Both LDCC and ULM already have programs in place that will help with this effort. The other major focus will be the involvement of students in STEM research and work. ULM has initiated the development of programs that will support this effort. LDCC faculty and students will be included in these programs.

LDCC Student Support Structure

Although LDCC is a young organization, it is making progress toward establishing a strong student support structure. Components include a comprehensive advising program that provides students one-on-one advising every semester. Another component is the Academic Seminar (ACSE 100), a course designed to maximize a student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by collegiate life. Attaining an appropriate balance between personal freedom and academic responsibility underlies all ACSE activities. All students are required to take the Academic Seminar.

By the fall semester, 2002, LDCC will have in place a fully functioning Learning Resource Center (LRC). The LRC will be designed to provide students with adequate opportunities to maximize their academic proficiency. The LRC will offer a computer lab, including course-based software, one-on-one and small group tutoring, writing

assistance, and workshops. The LRC will also provide a mentoring program for students who are having difficulty adjusting to college as well as counseling services.

LDCC's student support structure includes important agreements with other colleges and universities. For example, LDCC has formed a partnership with ULM so that students can utilize the ULM library and its services by using their LDCC identification card. LDCC has also formed articulation agreements with other state colleges and universities to ensure that students' course work will be transferable to statewide four-year institutions.

ULM Student Support Structure

ULM has a strong student support structure that includes a variety of components. The University received a five-year grant for \$1.7 million in 1999 to establish the Center for Academic and Student Success (CASS). The Center provides services including intensive academic and career counseling primarily for freshmen and sophomores and a college survival skills center (computers, software, and a resource library to enhance academic and student success).

ULM's Counseling Center for offers help to students with personal problems. Specifically, the Center offers help to students who have personal, career, substance abuse, and school-related needs. Students do not have to pay for the services of the center. All client-related information remains confidential according to the ethical standards set by the American Counseling Association.

ULM's Office of Career Services and Testing provides students with advice about graduate school and careers. The primary purpose of this office is to provide students with career planning consultation, assessment and advisement, opportunities to participate in career placement days, interviews with potential employers, selected workshops and seminars dealing with strategies for gainful employment. The office also coordinates a national testing program and operates a computer based testing center where students can take the GRE.

The University's Teaching and Learning Resource Center (TLRC) was established to provide programs, services, and resources designed to enhance the teaching-learning process, promote teaching as a scholarly activity, and facilitate interdisciplinary conversations about learning and teaching at every level and among all members of the ULM community.

The Project's Student Support Structure

The NLS STEP Program's student support structure will incorporate the services described above as well as the strategies that researchers have indicated will help retain female and black students. It is expected that these strategies will also benefit white males who are first-generation college students from low-income, rural families. Hewitt and Seymour (7) found minorities had great difficulty dealing with large classes and impersonal faculty attitudes. Highsmith, Denes, and Pierre (9) found that "role modeling and mentoring are important ingredients to the development of talent among groups traditionally underrepresented" in STEM. Likewise, other researchers have found that women tend to need friendly teachers, mentors and role models so that they will not feel isolated by their career choice (1,5,8). Therefore, the project's student support structure will emphasize the importance of a close relationship between students and their STEM advisors, peer study groups, tutoring, group projects, and positive classroom climate (1,6,9,12). Dr. Eaton and Dr. Pani will work with the TLRC to provide faculty workshops that will train STEM faculty to incorporate these strategies. All STEM faculty members from ULM and LDCC will be expected to attend these workshops. The overall purpose of the workshops will be twofold:

- To increase faculty awareness of, and sensitivity to, the difficulties that women and underrepresented minorities face in STEM classes; and
- To encourage faculty members to generate specific ideas to use in their own teaching to enhance the learning environment in STEM classes.

At ULM and LDCC, STEM faculty members will serve as advisors for students. Each STEM advisor will monitor the academic progress of his/her advisees. If a student is having problems, intervention will begin immediately. Intervention may include any or all of the following:

- Group tutoring
- Individual tutoring
- Advising from CASS for ULM students and LRC for LDCC students
- Counseling through the Counseling Center for ULM students and LRC for LDCC students

Student Research Opportunities

Undergraduate research participation is one key to greater student interest in careers in science and retention in undergraduate STEM programs. To encourage greater participation in the research experience, ULM instituted an Annual Student Research Conference in 2001. The Second Annual Student Research Conference was

held in April 2002. The number of posters presented has grown from 78 in the symposium's inaugural year, to 103 this year. In spring 2003, LDCC students will also be invited to participate.

In addition, many STEM faculty members at ULM are actively involved in undergraduate research. Dr. Pani and Mr. Tangye will work with ULM and LDCC faculty members to increase these efforts. They will also help faculty members to find funding, both internal and external, for undergraduate research projects. Current and/or recent undergraduate research projects at ULM include the following:

- The Howard Hughes Medical Institute (HHMI) Undergraduate Biological Sciences Education Program at ULM
This project offers 20 academic year Undergraduate Research Scholarships to students entering their junior year and 10 Summer Research Scholarships for off-campus research each year. To allow the broadest undergraduate science student participation, these awards are also available to ULM students majoring in Chemistry or Geosciences for research on biological questions.

The intent of this project is to promote the undergraduate research program as an integral part of the majors' curriculum. In Biology, it is coordinated with the Department's internship program to ensure the continuation of the program beyond the duration of a Hughes grant. The emphases of the undergraduate research experience on campus are the following: involve students in serious scientific inquiry, facilitate deeper understanding of one focused area of science, and expose students to the research methods and discipline needed for graduate studies. The yearlong experience is capped by a poster session open to the university community and the public. Local high schools are invited to the symposium.

Substantive training in laboratory and field research methods prepares undergraduates for off-campus research opportunities in the summer following the junior year. A partnership between ULM and Louisiana State University (LSU) accommodates most awardees of the Summer Research Program. The existing LSU program offers a well-established stimulating (but non-threatening) environment in which students can develop individual research projects in a mentor's laboratory. The peer reinforcement also provided by this program has proven to be an invaluable asset in scientific training of all participants, especially for minority, female, and first-generation college students. It is a capstone experience highlighting the student's undergraduate education.

- The HHMI Faculty Development Program at ULM

Nine research awards are available to junior and senior faculty over the duration of the HHMI grant. These awards consist of summer stipends of \$7500 and \$15000 for research expenses. Faculty awards require collaboration with established scientists at major research institutions and must include undergraduate research participation on the ULM campus.

- Biomedical Research Infrastructure Network (BRIN)

ULM partnered with colleagues at LSU, Southern University, and Southern University-New Orleans in a successful proposal to the National Institutes of Health for a Biomedical Research Infrastructure Network (BRIN) grant for Louisiana. The \$5.9 million grant offers opportunities for faculty development, strongly linked to mentoring both undergraduate and graduate student research, in Computer Sciences, Mathematics, Chemistry, and Biology. Although much of the emphasis is in computational biology and visualization of molecular structures, the program also supports other areas of biomedical research. ULM has applied for a supplemental grant of \$1.4 million to the same program to extend the BRIN to two other undergraduate institutions and the College of Pharmacy at ULM. The HHMI Undergraduate Biological Sciences Education Program at ULM was noted in both proposals as an indicator of ULM's commitment to undergraduate research and the development of actively engaged faculty to serve as their mentors.

- Dr. Frank Pezold, Department of Biology

In summer 2002, four undergraduate students will extend their research experience by participating in a project in Guinea, West Africa funded by the National Science Foundation's Summer Research Experience for Students program. They will assist Dr. Frank Pezold in conservation research in the Parc National du Haut Niger.

- Dr. Thomas Junk, Department of Chemistry

Dr. Junk has funding from the J. Bennet Johnston Science Foundation for a project entitled "Superheated Water as Environmentally Friendly Reaction Medium." Ongoing work will provide: baseline data on the stabilities of organic compounds in superheated water; improved, cleaner methods of preparation for two important classes of compounds, halogenated aromatics and substituted phenols; and training of undergraduate students in the concept and implementation of "green" chemistry.

- Dr. Stephen Fox, Department of Chemistry

In this project, undergraduate chemistry majors worked during two summers with Dr. Stephen Fox. Under Dr. Fox's guidance, the students focused on ligand synthesis prior to the ensuing complexation under Ar. During the first summer they focused on complexes **A** and **B** and their oxidized counterparts. In addition, they developed solvent and counter-ion conditions to crystallize the products, also under Ar. Suitable crystals were sent to the University of Minnesota Structure Center for structure determination. The study of N₂O coordination and reactivity

utilized Perkin-Elmer Paragon 500 FTIR and Finnigan Mat GC-MS equipment available in the ULM Department of Chemistry. The second summer of the granting period was devoted to continued ligand and complex synthesis (model C) and ensuing coordination/reactivity studies with N₂O.

- Dr. Mike Camille, Department of Geosciences

Using the computer lab as his classroom, Dr. Camille is helping his students develop a basic understanding of how GIS can be practically applied to understanding geographical issues and solving a variety of problems. While the students are tackling these problems, they learn about the workings of GIS itself, thereby acquiring the skills needed to study specific environmental problems of their choosing such as desertification, earthquake risk, and coastal erosion. As an example of the importance of GIS in facilitating student research, Dr. Camille prepared three of the four ULM students who will be conducting GIS field research in Guinea in summer 2002 as part of Dr. Frank Pezold's two-year Niger River biodiversity project. Dr. Camille has been primarily focusing on northeastern Louisiana in his undergraduate research projects. The titles of current GIS-based undergraduate research projects reflect their diversity:

- "Current distribution patterns of freshwater mussels in Bayou Bartholemew,"
- "Ouachita Wildlife Management Area water boundaries,"
- "Islands in the making,"
- "Tornado activity in Oklahoma,"
- "Substrate composition of Bayou DeLoutre,"
- "Nutrient production of various plant species in southwest Louisiana,"
- "Fish populations within the Kisatchie National Forest,"
- "Business modeling using GIS," and
- "Surface models of Watson Brake."

Internship/Co-Op Opportunities

Experiential education (i.e. internships, practicums, fieldwork, part-time jobs) is another key to greater student interest in careers in science and retention in undergraduate STEM programs. Within the Northeast Louisiana region, there are several government agencies and industries that would benefit from additional personnel with STEM backgrounds. These include, but are not limited to: United States Army Corps of Engineers Waterways Experiment Station, Louisiana Department of Environmental Quality, Angus Chemical, State Farm Insurance, CenturyTel, and Riverwood International (paper). In spring 2002, in response to interest from the business community and students, ULM began the process of establishing a university-wide Internship/CoOp Center. Currently, individual departments and one college (business) provide experiential education opportunities for their students but there is no formal university-wide program. ULM is working with local businesses and local economic development entities in its service region to supplement these existing departmental and/or college internship programs with a formal university-wide program. A faculty committee has been appointed to make recommendations for the development of the Internship/CoOp Center. Dr. Virginia Eaton is the chair of this committee. The Center will be established in fall 2002. ULM has requested \$100,000 in recurring funds and \$30,000 in non-recurring funds to establish the Center. The PIs will work closely with the Center and the Advisory Committee to find intern or co-op positions for as many undergraduate STEM majors as possible.

Plans for Evaluation of Project Activities and Dissemination of Outcomes

Data will be collected to verify that the following outcomes have or have not been achieved:

- 50% of students enrolled in the Bridge program will be women
- 50% of students enrolled in the Bridge program will be underrepresented minorities
- 75% of students completing the Bridge program will enroll as STEM majors in college
- 75% of students completing the Bridge program will increase their ACT scores by at least 10%
- At LDCC and ULM, the number of women in STEM will be increased by at least 10% in the fall of 2005 as a result of the program.
- At LDCC and ULM, the number of underrepresented minorities in STEM will be increased by at least 25% in the fall of 2005 as a result of the program.
- At LDCC and ULM, at least 25% of STEM majors will participate in undergraduate research during the first year of the pilot program, at least 30% during the second year, and at least 35% during the third year.
- At LDCC and ULM, at least 25% of STEM majors will participate in an internship or co-op job during the first year of the pilot program, at least 30% during the second year, and at least 35% during the third year.
- At LDCC and ULM, at least 25% of STEM faculty will participate in the undergraduate research program during the first year of the pilot program, at least 30% during the second year, and at least 35% during the third year.

- At LDCC and ULM, 100% of STEM faculty will participate in a TLRC mentoring workshop. A web site will be created as soon as the program is funded. This site will be used for recruitment; interaction between STEM students, faculty, and alumni; and dissemination. Throughout the project, the PIs will be sharing information about successful and unsuccessful methods for recruitment, intervention, and retention. The PIs will also make presentations about program outcomes at state, regional, and national conferences.

Management and Administrative Plan

Dr. Virginia Eaton will serve as principal investigator (PI) and be responsible for the overall management of the project. She has taught computer science at ULM since 1988 and was promoted to full professor in 1999. Prior to becoming a university instructor in 1984, Dr. Eaton taught middle school and high school computer science, English, and mathematics. Dr. Eaton is also an experienced administrator, who has been the PI for programs for pre-college students, college students, and K-12 teachers. These projects include the ULM Young Scholars projects in 1989-1990 and 1993-1997, the ULM Teacher Enhancement project in 1995-1998, and the ULM Gender Equity project in 2000-2001. In addition, Dr. Eaton has served as a NSF program director for Young Scholars, POWRE, CRCDD, and ITW, all of which are related to the recruitment and retention of women and underrepresented minorities in science, mathematics, and technology careers. As PI, Dr. Eaton will work closely with Ms. Green, Dr. Pani, and Mr. Tangye on all aspects of the program. She will assist with the developmental classes, teach the computer classes, and serve as one of the research project leaders. She will ensure that data are collected and provided to the Advisory Committee for evaluation of the project. She will have the primary responsibility for maintaining the project web site.

Ms. Tiffany Green, Assistant Professor of Science, will serve as the PI for the subaward to LDCC. Ms. Green has recently completed a Master's degree in geoscience. As a graduate student, Ms. Green was actively involved in research and several publications to her credit. While all of the PIs will be involved in the recruitment and selection of students, she will have the primary responsibility for the testing process. She and Dr. Eaton will work closely on organizing and coordinating the instructional and research activities both for the summer and the follow-up period and on the collection of data. Ms. Green will also assist with the developmental classes and serve as a research project leader.

Dr. Eric Pani, Dean of the College of Pure and Applied Sciences, will serve as a co-PI for the project. Dr. Pani has been active in a variety of research areas in meteorology and is currently working with undergraduate students studying microclimates and vegetation. He has also been active in science education reform, serving at both the state and regional level. Dr. Pani has twice been recognized as an outstanding faculty member at ULM. As co-PI, Dr. Pani will oversee the Mentoring Program at ULM. He will work with STEM faculty to ensure that they attend TLRC workshops to learn strategies to improve their teaching and that they implement these strategies in their classrooms. He will encourage STEM faculty to involve undergraduates in their research and to seek funding for providing these opportunities. He will work with STEM faculty to get students placed in intern/coop positions.

Mr. Ronald M. Tangye, Professor of Speech Communication and Dean of Arts and Sciences at Louisiana Delta Community College, will serve as a co-PI for the project. Dean Tangye has been recognized as a four time Phi Theta Kappa (International Honor Society for Community Colleges) member of Who's Who Among America's Teacher's. Dean Tangye is a regular visitor to all area high school's discussing and encouraging higher education opportunities in northeast Louisiana. As co-PI, Mr. Tangye will oversee the Mentoring Program at LDCC and perform duties similar to Dr. Pani's.

All of the PIs will be involved in the recruitment and selection of students. They will also be involved in the evaluation of the project and dissemination of results. All four will attend the quarterly meetings with the Advisory Committee.

The Advisory Committee will have a major role in both the formative and summative evaluation of the project. Formative evaluation will include quarterly meetings with project staff. The Advisory Committee will review project activities and make recommendations for any needed changes. At the end of each year, the Advisory Committee will review progress toward achieving benchmarks and make recommendations for any needed changes. At the end of the grant period, the Advisory Committee will provide a summative evaluation of the project and make recommendations for future efforts. In addition, the Advisory Committee will seek community support for the project and assist with dissemination of results. The Advisory Committee will be chaired by Dr. Stephen Richters, ULM Provost and Vice-President for Academic Affairs. It will be co-chaired by Dr. Monty Sullivan, LDCC Vice Chancellor of Academic and Student Affairs. Other Advisory Committee members will include the following:

- Voleria Millikin, Elementary Education Supervisor and Adult Education Supervisor, East Carroll School System
- Mordessa Corbin, Retired secondary mathematics teacher
- Albert Sit, MIS Specialist, Monroe City School System

- Ronald Phillips, Vice-President for Workforce Development, Monroe Chamber of Commerce
- Augie Augurson, Agent, State Farm Insurance Co.
- Dr. Rose Kress, Research Physical Scientist, Waterways Experiment Station, US Army Corps of Engineers
- Clarence Hawkins, Louisiana Workforce Commission
- Stephanie Durand, Angus Chemical Company
- Barbara Gombossy, Ross Creative Services

Previous Efforts

Pre-college Outreach

Faculty members at ULM have aggressively sought to improve K-12 science education in the lower Delta to better prepare students for college studies. They have spearheaded a number of science and mathematics teaching reform initiatives. Recent efforts have included participation in one of five school district/university partnerships in Louisiana funded by a Department of Education Challenge Grant to increase technology in the classrooms. The University also jointly administers the Louisiana component (21 parishes) of the Delta Rural Systemic Initiative (Delta RSI) with the Louisiana Systemic Initiative Program (LaSIP) office in Baton Rouge. The Delta RSI, sponsored by the National Science Foundation (NSF), is focused on the needs of schools in rural, economically disadvantaged regions of Arkansas, Louisiana and Mississippi, primarily in the lower Mississippi River Delta. Its fundamental goal is to improve student achievement in mathematics, science and technology through professional development for teachers, leadership training, technical assistance and science and mathematics education reform.

Recruitment of students, especially underrepresented minority and female students, into the sciences has been a high priority in the College of Pure and Applied Sciences. Toward that end, STEM faculty members, particularly in geosciences and computer science, have been successful in acquiring numerous grants through programs funded by NSF, the Department of Education and The National Faculty. These funds have been primarily directed toward in-service training for teachers, but have also included pre-service teacher education and the hands-on instruction of middle school and high school students. Considering that some of these programs have been in existence for more than five years, by a conservative estimate, several hundred teachers and more than 30,000 students have benefited from these efforts.

Curriculum, Equipment and Laboratory Development

Over the last five years, many departments in the College of Pure and Applied Sciences have been restructuring their curricula and upgrading laboratories with modern instructional and research technology.

In Biology, these changes, supported by more than \$500,000 in NSF and Board of Regents grants, have spanned the breadth of the program. At the introductory level, the Department of Biology has developed: a first-semester course for science majors focused on biological principles with a writing-intensive laboratory; an interactive, state-of-the-art biology multimedia center for student-authored projects in a non-major's introductory course; and a computer-enhanced laboratory for human anatomy and physiology instruction. Upper-level laboratory improvements over the last three years have included development of: a molecular genetics laboratory; improved cellular/molecular laboratory facilities with the purchase of fractionation equipment; an Environmental Science Experimental Facility with environmental control chambers; a multimedia computer graphics center shared with Chemistry; and upgraded animal and plant physiology laboratories with video microscopy and computer-interfaced research instrumentation. As with the first-year curriculum, instructional changes have been toward inquiry-based approaches that develop students' critical-thinking skills. The laboratory enhancements have presented students new opportunities to participate in meaningful experiences with modern technology and have facilitated student involvement in ongoing research projects in physiology and molecular and cellular biology.

The Department of Computer Science will be moving into a new building in the summer of 2002. The new building will include state-of-the-art laboratories for non-majors and majors as well as a video-conferencing center that can provide educational and training opportunities for K-12 students and teachers throughout the region. The computer science program has been accredited since 1988. In order to maintain its accreditation, the curriculum is periodically reviewed and modified to meet the requirements of accreditation as well as a continually evolving field.

All departments in the College of Pure and Applied Sciences have benefited from ULM's Student Technology Access Program (STAP) fund. The STAP fund comes from the STAP fee paid by all ULM students. A STAP committee composed of ULM students and faculty manages this fund. Faculty members submit technology proposals to the STAP committee, which reviews the proposals and makes recommendations for funding. Equipment purchased with STAP funds must be available for student use.

Faculty Development

The University established the Teaching and Learning Resource Center several years ago to promote excellence in teaching. The Center sponsors workshops, seminars and a library dedicated to improving teaching skills and increasing access to information on modern instructional methods and technologies. Workshops and seminars draw about 350 faculty each year. Every fall the Center sponsors an Academy for Teaching Excellence that meets 2 hours per week for 10 weeks. Topics addressed include class planning, innovative alternatives to lectures, technology applications, problem-based learning and assessment. STEM faculty members have actively participated in and contributed to the offered programs since the facility's inception.

Broadening Access to Science

More than half of ULM students are female and about a fourth are underrepresented minorities. In light of the importance of mentorship and role identification to student success, the College of Pure and Applied Sciences has committed to hiring and retaining female and minority faculty. In addition, the College is committed to recruiting and retaining female and minority students.

In 1999, the Department of Geosciences formed a cooperative agreement with the Monroe City School System to implement an instructional and hands-on program in Atmospheric Science and Meteorology for grades seven through twelve at the Carroll Magnet Cluster (junior and senior high schools). The goal of this program is to stimulate student interest in mathematics and science. Students will have opportunities for internships and college credit. The high minority enrollment in this urban school district (85%) promises significant inclusion of underrepresented minority students in the program.

The Department of Computer Science has initiated several programs aimed at increasing the number of female and minority students majoring in computer science. From 1989 through 1997, the Department received funding for summer programs for middle school students from the NSF's Young Scholars Program. From 2000 to 2001, the Department received funding for a summer program for middle school girls from NSF's Gender Equity Program. In 2001, the Department received a two-year grant from NSF's Computer Science Engineering Mathematics Scholarship (CSEMS) program. Funding was received for 25 scholarships for low-income computer science majors. The objective of the ULM Computer Science Scholarship program is to increase the number of students, especially female and black students, who graduate with a degree in computer science. Dr. Virginia Eaton has been PI or Co-PI on all of these projects.

Future Efforts

The PIs anticipate that this pilot project will be successful and serve as a model for future efforts to achieve the goal of increasing the number of students pursuing and receiving associate and baccalaureate degrees in established or emerging STEM fields. It is anticipated that the number of STEM degrees conferred by ULM will significantly increase as a result of more students entering STEM via the Bridge Program and being retained to graduation by the Mentoring Program. Likewise, it is anticipated that a significant number of degrees conferred by LDCC will be in STEM majors as a result of the NLA STEP Program. If the project is a success as anticipated, funding will be sought from public and private sources at the local, state, and national level to continue and expand the Bridge Program. Likewise, the Mentoring Program will be continued and expanded to ensure that all STEM majors are involved in undergraduate research as well as co-op/intern positions on and off campus. Data collection will continue, and results will be widely disseminated via conferences, journals, and the Internet.