

# NC-LSAMP

**NORTH CAROLINA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION**

**Gateways to Graduate Excellence in Science, Mathematics, Engineering, and  
Technology: A Decade of Louis Stokes AMP Achievement**

## **2000-2001 AMP ANNUAL REPORT**

### **Partner Institutions**

**North Carolina Agricultural & Technical State University**

**(Lead Campus)**

Fayetteville State University

North Carolina Central University

North Carolina State University

University of North Carolina-Charlotte

University of North Carolina-Chapel Hill

University of North Carolina-Pembroke

Winston-Salem State University

**Annual Report: 9702237****Annual Report for Period: 01/01/00 – 12/31/01 Submitted on: 10/30/2001****Principal Investigator: Carolyn W. Meyers Award ID: 9702237****Organization: North Carolina A&T State University****AMP: North Carolina Alliance for Minority Participation (NCAMP)****Project Participants****Senior Personnel****Name: Carolyn W. Meyers: Principal Investigator****Worked for more than 160 Hours: Yes****Contribution to Project:**

Carolyn W. Meyers serves as Principal Investigator and Executive Director of the Alliance.

**Name: Kenneth L. Roberts: Co-Principal Investigator****Worked for more than 160 Hours: Yes****Contribution to Project:**

Kenneth L. Roberts serves as Co-Principal Investigator

**Name: Vivian H. Hampton: Alliance Coordinator****Worked for more than 160 Hours: Yes****Contribution to Project:**

Vivian Hampton serves as Alliance Coordinator 100% of the time. She is also a member of the Executive Committee. This position is funded 64% with NSF funds and 36% with state matching funds.

**Name: Julia M. Bryant: Program Assistant****Worked for more than 160 Hours: Yes****Contribution to Project**

Julia M. Bryant serves as the Alliance Program Assistant 100% of the time. She is also a member of the Alliance Executive Committee. This position is fully funded through the NSF grant.

**Name: Bertha Miller: Campus-Level PD****Worked for more than 160 Hours: Yes****Contribution to Project**

Bertha Miller serves as the campus level project director for Fayetteville State University. She is also a member of the Executive Committee.

**Name: Mattie Moss: Campus-Level PD****Worked for more than 160 Hours: Yes****Contribution to Project**

Mattie Moss serves as the campus level project director for North Carolina Central University. She is also a member of the Executive Committee.

**Name: Tony L. Mitchell: Campus-Level PD****Worked for more than 160 Hours: Yes****Contribution to Project**

Tony L. Mitchell serves as the campus level project director for North Carolina State University. He is also a member of the Executive Committee.

**Name: William Gash, Jr.: Campus-Level PD****Worked for more than 160 Hours: Yes****Contribution to Project**

William Gash, Jr. serves as the campus level project director for the University of North Carolina at Pembroke. He is also a member of the Executive Committee.

**Name: Harold Woodard: Campus-Level PD****Worked for more than 160 Hours: Yes****Contribution to Project**

Harold Woodard serves as the campus level project director for the University of North Carolina at Chapel Hill. He is also a member of the Executive Committee.

**Name: Bill J. Hill: Campus-Level PD****Worked for more than 160 Hours: Yes****Contribution to Project**

Bill J. Hill serves as the campus level project director for the University of North Carolina at Charlotte. He is also a member of the Executive Committee.

**Name: Richard Bennett, Jr.: Campus-Level PD****Worked for more than 160 Hours: Yes****Contribution to Project**

Richard Bennett, Jr. serves as the campus level project director for Winston-Salem State University. He is also a member of the Executive Committee.

**Name: James C. Renick: Alliance Advisory Board Chairman****Worked for more than 160 Hours: No****Contribution to Project**

James C. Renick, chancellor, North Carolina A&T State University, serves as the chairman of the NC-LSAMP Advisory Board. He assumed the role effective July 1999. Chancellors of all Alliance institutions are members of this governing Board.

**Post-doc****Graduate Student****Undergraduate Student****Organizational Partners****Fayetteville State University**

Fayetteville State University contributed \$102,824 non-federal matching funds for year four.

**North Carolina Central University**

North Carolina Central University contributed \$123,269 in non-federal matching funds for year four.

**North Carolina State University**

North Carolina State University contributed \$255,420 in non-federal matching funds for year four.

**University of North Carolina at Chapel Hill**

University of North Carolina at Chapel Hill contributed \$99,169 in non-federal matching funds for year four.

**University of North Carolina at Charlotte**

University of North Carolina at Charlotte contributed \$252,520 in non-federal matching funds for year four.

**University of North Carolina at Pembroke**

University of North Carolina at Pembroke contributed \$214,285 in non-federal matching funds for year four.

**Winston-Salem State University**

Winston-Salem State University contributed \$95,000 in non-federal matching funds for year four.

**Other Collaborators or Contacts****OAK RIDGE NATIONAL LABORATORY**

The North Carolina LSAMP has collaborated with the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee for the past five years. This involvement is executed under the auspices of Dr. Linda C. Cain, director, Office of University and Science Education (OUSE). SMET students and faculty at partner institutions are provided opportunities to engage in a wide range of research-related programs through special arrangements. Primarily, these experiences are associated with summer internships for undergraduate students in SMET disciplines. Limited internships are also available during the academic year. Annually, SMET students and faculty participate in the Annual Women in Science and Technology Conference (WIST) in conjunction with OUSE/ORNL. This event has been held at ORNL in Tennessee for the past five years. In 1998, Dr. Linda C. Cain was keynote speaker for the Opening Plenary Session of the Second Annual NC-LSAMP Undergraduate Research Conference. During this AMP-wide Conference, Dr. Cain interacted extensively with SMET students and faculty. Comprehensive information describing research/internship opportunities at ORNL is routinely disseminated across the Alliance throughout the academic year.

**CREST PROGRAM**

The NSF Center of Research Excellence in Science and Technology (CREST) Program at North Carolina A&T State University (NCA&TSU) and North Carolina State University (NCSU) continues to provide a variety of research-related experiences for SMET students through collaborative efforts. Education and research are integrated through this program to produce new knowledge and increase minority student presence in SMET disciplines by making substantial research resources available. At NCA&TSU, the CREST Program 'Center for Advanced Materials and Smart Structures' (CAMSS) is in its fourth year. The sub-center is located at NCSU. CAMSS is an educational and research resource for the state of North Carolina and the nation, in the field of advanced ceramic materials and their composites. Through the collaboration of academe, private industry, and the government in developing basic and applied research programs, there is a major focus on student participation and learning. Research experiences are continually expanded to motivate undergraduates to pursue graduate studies in the CREST-related areas. Additionally, summer research opportunities at collaborating industry and government facilities for undergraduate and graduate students reinforce the relevancy of the research and assist talented students in bridging the gap between engineering theory and practice. An Undergraduate-Graduate Transition Program implemented jointly by NC-LSAMP and CAMSS for rising seniors, includes exposure to current research issues being addressed by CREST. During the Fifth Annual NC-LSAMP Undergraduate Research Conference, CREST and AGEP directors, faculty, and students (master's and Ph.D. levels), participated in a SMET graduate roundtable focusing on several facets of graduate education.

**AGEP/MGE PROGRAM**

In 1999, the NSF awarded funding to North Carolina State University (NCSU), the University of NC at Chapel Hill (UNC-CH), and North Carolina A&T State University (NCA&TSU) for implementation of Alliances for Graduate Education and the Professoriate (AGEP) Projects. These programs were formerly titled Minority Graduate Education (MGE) Projects. During the current reporting period, NC-LSAMP institutions collaborated with AGEF in special efforts aimed at significantly increasing the number of underrepresented minority students receiving Ph.D. degrees in SMET fields and entering the professoriate.

Institutions in the North Carolina Minority Graduate Education Partnership will triple the number of doctoral students prepared for faculty careers in science, mathematics, and engineering (SME) over the next four years. This partnership is a comprehensive recruitment and mentoring initiative designed to change institutional cultures as it develops interest in SME research, and particularly in academic careers, among underrepresented minority students from their junior undergraduate year through completion of doctoral education. Components consist of intensive faculty-mentored research experiences for minority NCSU SME undergraduate students, and for students from NC-LSAMP universities. NCA&TSU is identifying and recruiting NC-LSAMP students to participate in the "Student Transition and Retention"(STAR) Program, which is directed by the School of Graduate Studies. Special cluster groups are addressing graduate problem solving and career exploration. Both NCSU and NCA&TSU offer mentored training programs to prepare selected SME doctoral students for future faculty positions. Jointly, the partner institutions provide research training and student development seminars throughout the year. In addition, NCSU offers a training program for participating faculty aimed at developing skills in mentoring diverse populations. A seminar series is also open to all graduate students and faculty focusing on themes of inclusiveness and issues of diversity.

The project at UNC-CH has three major purposes: to further enhance the education and production of underrepresented minority Ph.D. degree recipients in science and mathematics; to expand an undergraduate component to increase participation of UNC-CH minority undergraduate students in research with UNC-CH science and mathematics faculty members, and encourage students to pursue graduate studies in those disciplines; and to expand the summer research program to support fulltime opportunities for summer research targeting undergraduate students, and prospective graduate students, primarily from other institutions to work with UNC-CH science and mathematics faculty.

Representative activities provided by the North Carolina Minority Graduate Education partnership include: Training for Faculty Mentors; Mentored Undergraduate Research Experiences and Training; Recruitment and Retention Events; Graduate Fairs; University Visitation Day; Peer-Oriented Collaborative Cluster Groups; Preparing Future Faculty for Academic Careers; and Joint Seminar Series.

### **HBCU-UP PROGRAM**

The NSF awarded funding to NCA&TSU in 1999 to support an Historically Black College and University-Undergraduate Program (HBCU-UP). This Program entitled, 'Talent-21: Gateway for Advancing Science and Mathematics Talent,' is a five-year, comprehensive, academic project encompassing curriculum development and reform, integration of technology in teaching, infrastructure improvement, faculty development, student learning and research development. Collaborative activities involving NCA&TSU, other HBCU institutions, industry, and government laboratories are designed to substantially strengthen the SMET academic infrastructure for undergraduate education. Additionally, overall student learning is being enhanced in SMET gatekeeper courses (calculus, chemistry, and physics); the number of minority students earning B.S. degrees in SMET disciplines will be significantly increased; research training and experiences have been expanded for minority students promoting an increase in the number of SMET graduate degrees and related careers; and student research and technology skills are being systematically developed for students at all participating institutions. A number of students engaged in the HBCU-UP initiative presented research projects in oral and poster sessions during the Fifth Annual NC-LSAMP Annual Undergraduate Research Conference on April 20, 2001.

## ACTIVITIES AND FINDINGS

### **Goals of the North Carolina Louis Stokes Alliance Project:**

The primary aim of the North Carolina Louis Stokes Alliance for Minority Participation (NC-LSAMP) Program is to significantly increase the numbers of underrepresented minority students earning B.S. degrees, and subsequently pursuing Ph.D. degrees in SMET discipline through systemic enhancement of recruitment, retention, opportunities, and access to education, internships, and research in these fields. Specific Alliance goals and representative Alliance-wide activities and findings are described below.

#### **Alliance Goals:**

- To development and implement effective methods of attracting talented minority students who would otherwise not choose careers in science, mathematics, engineering, and technology (SMET) fields;
- To improve the quality of the learning environment for minority SMET students at all schools; and
- To substantially increase the numbers of minority students graduating with B.S. degrees in SMET disciplines.

#### **Project Activities and Findings:**

Several research-focused and education activities are offered by the North Carolina Louis Stokes AMP Project to support minority students pursuing B.S. degrees in SMET disciplines.

#### **1. Project Activities:**

##### **Summer Bridge Program (transition from high school to college)**

The University of North Carolina at Pembroke hosted the 2001 NC-LSAMP Summer Bridge Program.

This annual Alliance-wide activity is designed to enhance access and overall success for underrepresented students enrolling in SMET degree programs at partner universities. Newly admitted freshmen are provided a "head start" with transitioning from high school to college studies. The five-week program includes four major components: 1) diagnostic testing; 2) lecture and laboratory, basic mathematics and science enrichment, e.g., biology, chemistry, computer science, ecology, college algebra, and physics, etc.; 3) academic study strategy development; and 4) time, stress, and interpersonal management workshops. In 2001, twenty-one (21) students were served, and 43% of these participants were Native American. Among Native American students, 56% were female, and 44 % were male. Other students in the Program were African American, with 70% female, and 30% male. The remaining two participants were a male Hispanic and a male who reported two or more race/ethnicity categories.



**Supplemental Instruction**

The Alliance intends to improve the academic performance of minority students in science, mathematics, engineering, and technology (SMET) degree programs through instructional enhancement during the freshman through senior years. Supplemental instruction activities are provided to sustain a high level of student performance in gatekeeper courses (i.e., physics, chemistry, biology, and calculus). Specific strategies utilized include a collaborative learning approach; hands-on classroom and laboratory experiences; peer study groups; emphasis on developing and reinforcing problem-solving skills; computer-application assistance; and more intensive, positive student-faculty involvement. These academic enhancement activities and strategies ensure a continuous focus on the progress of minority students through SMET curricula.

**Undergraduate Research Program**

The Undergraduate Research Program is a major component of the North Carolina Louis Stokes Alliance (NC-LSAMP). This concentrated initiative specifically addresses the retention, education, and graduation of NC-LSAMP students through focused research experiences providing early exposure to a graduate/postgraduate environment. Guided student research is facilitated by SMET faculty at partner institutions, who serve as mentors. In addition, ongoing provisions allow students to present their faculty-mentored research projects at local, state, and national research conferences.

**FINDINGS:****2. Major Findings Resulting from Activities:**

A. Summer Bridge Program data indicate that among the total population of students, who completed the Summer Bridge Program in 1997, 1998, 1999, and 2000, 98% are currently enrolled in a SMET degree program at an NC-LSAMP university. Moreover, 100% of 2001 participants enrolled at a partner campus in the fall of the current semester.

B. Approaches to supplemental instruction in SMET disciplines are promoting more positive and sustained communication with faculty, and intensive interaction with faculty, student mentors, and other support persons at the university. Student interest and overall success in SMET areas are boosted by continued Alliance-wide expansion of hands-on experiences in SMET through collaborative class projects, undergraduate research opportunities, internships with industry, and participation in SMET professional meetings and conferences. Consequently, Alliance partners continue to improve student performance in all 'gatekeeper' courses through group study and collaborative learning strategies. Additionally, a growing community of learners has been established among SMET students at all NC-LSAMP partner institutions.

**STUDENT PERFORMANCE CHART**

Ongoing, systemic efforts to improve student success in 'gatekeeper' courses during the 2000-2001 academic year had the following results:

**Grade Performance C or Better**

	1996-97	1997-98	1998-99	2000-01
<b>Biology</b>	51%	75%	75%	77%
<b>Calculus</b>	64%	71%	75%	76%
<b>Chemistry</b>	50%	74%	72%	73%
<b>Physics</b>	61%	51%	55%	56%

C. The ongoing accomplishments of the Undergraduate Research Program are significant. On April 20, 2001, North Carolina A&T State University hosted the Fifth NC-LSAMP undergraduate Research Conference. The Conference theme was, "Gateways to Graduate Excellence in Science, Mathematics, Engineering, and Technology: A Decade of Louis Stokes AMP Achievement." Since the inception of the conference in 1997, participation by both students and faculty has dramatically increased. In 2001, a record number was accomplished for poster (n=49) and oral (n=45) presentations and for overall conference attendance. The total attendance of 403 students and faculty represents a significant growth of 90% since the initial conference; poster presentations have grown by 250%; and oral presentations increased by 114%. Student presenters represented the eight NC-LSAMP partner institutions, and guest students from the South Carolina Louis Stokes AMP Program. A former NC-LSAMP biology major currently teaching in a local high school attended the conference with 25 students interested in pursuing B.S. degrees in SMET fields. In addition, an outstanding keynote address was delivered by Dr. Roosevelt Y. Johnson, AGEP Program Director at NSF. Also, a graduate student roundtable on SMET diversity moderated by Dr. Johnson provided valuable information for LSAMP students focusing on a variety of key topics related to graduate school recruitment, enrollment, and matriculation. Panelists for the roundtable consisted of six LSAMP students, who earned either an M.S. or Ph.D. degree in a SMET discipline. Two additional features of the 2001 conference were the "SMET Deans' Welcome" in the opening session, and the "parade of LSAMP scholars" in conjunction with the awards banquet. This year's research conference was facilitated through joint sponsorship by the NC-LSAMP Project and other NSF diversity-focused programs, including the Historically Black Colleges and Universities-Undergraduate Program (HBCU-UP); the Center of Research Excellence in Science and Technology (CREST); and the Alliances for Graduate Education and the Professoriate (AGEP) Program.

Alliance-wide, students and faculty mentors continued participation in a number of SMET-related local, state, and national conferences and professional meetings. Representative events in this category include: North Carolina Council of Teachers of Mathematics; The Mathematical Association of America; Association of Mathematics Teacher Educators; SOARS Conference at Winston-Salem State University; Life and Physical Sciences Symposium at North Carolina A&T State University; National Conference of Undergraduate Research; National Organization of Minority Architects (NOMA) Conference (Charlotte); Undergraduate Research Conference (UNC-Charlotte); American Indian Science and Engineering Society National Meeting (Minneapolis); National Engineers Week Summit on Diversity; Association of Computing Machinery Meeting (Atlanta); National American Chemical Society Regional Meeting; Pfizer Pharmaceutical SURF Meeting; GLAXO Welcome National Symposium; the North Carolina Council of Undergraduate Research; Undergraduate Mathematics Festival; North Carolina Academy of Sciences



Annual Meeting; North Carolina State University Undergraduate Research Symposium; NAFEO Conference; Symposium of Computing at Minority Universities; National Conference of Black Physics Students; NASA Conference; NSBE Regional Meeting; Technology Education Collegiate Association; Institute of Industrial Engineers; Southeastern Regional Meeting of the American Chemical Society; National Minority Research Symposium; North Carolina Science Meeting; UNCC Graduate Fair; McNair Scholars Research Conference; Beta Kappa Chi National Institute of Science; Central North Carolina ACS Meeting; Bioinformatics Workshop; ADMI Minority Computing Conference; Mid-Southeast ACM Fall Conference; The Fifth World Multi-Conference on Systemics, Cybernetics, and Informatics; Regional and National NSBE Meetings; and the Annual American Society of Microbiology Meeting. Furthermore, NC-LSAMP students and faculty mentors participated in the Annual EXPO and Research Conference sponsored by the Florida-Georgia Louis Stokes Alliance for Minority Participation Project held at the Convention Center in Daytona Beach, Florida.

## **ADDITIONAL ALLIANCE INFORMATION AND DATA**

### **Summary: Alliance SMET Recruitment, Enrollment, and Degree Production**

The North Carolina Louis Stokes Alliance for Minority Participation (NC-LSAMP) Project continues to systemically impact SMET education at all member institutions. Through concentrated, aggressive recruitment efforts targeting underrepresented minority groups, the Alliance has experienced dramatic increases in enrollment since the baseline year. Total minority enrollment has increased from 4,632 in fall 1994 to 6,230 students in fall 2000, reflecting an increase of approximately 35%. To illustrate specific growth patterns, African American SMET enrollment in fall 1994 was 4,210, while Native American enrollment was 233, and Hispanic American enrollment was 189. In fall 2000, African American enrollment was 4,636 (an increase of 10%), Native American enrollment was 258 (an increase of 11%), and enrollment for Hispanic American students was 300 (an increase of 59%). High school graduation trends in North Carolina over the next ten-year period indicate that the University of North Carolina system will continue to attain record enrollment growth at each NC-LSAMP institution. Consequently, it is anticipated that SMET recruitment efforts in progress among NC-LSAMP partner universities will result in a substantial number of entering students enrolling in SMET degree programs.

Degree production has also been significantly augmented in SMET disciplines for underrepresented minority students since the baseline year. In spring 1995, baseline data for NC-LSAMP universities consisted of 799 B.S. degrees awarded to underrepresented minorities in SMET disciplines. In 2001, a total of 1,034 B.S. degrees were awarded to minority students collectively (i.e., African American, Native American, Hispanic, and Pacific Islander students). The total growth in SMET B.S. degree production for minority students since 1995 is 29.4%. Additionally, in spring 2001, the Alliance awarded 233 master's degrees to minorities in SMET fields (139 African American, 2 Native American, 19 Hispanic American, and 73 Pacific Islander). Moreover, 39 Ph.D. SMET degrees were earned by minority students (16 African American, 1 Native American, 5 Hispanic American, and 17 Pacific Islander). SMET enrollment and degree data for the 2000-2001 academic year are presented as an attached file.

**SMET ENROLLMENT AND SMET DEGREES****Baseline**

<b><u>Enrollment</u></b>	<b>Fall ' 94</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
<b>African American</b>	5,218	4,375	4,306	4,298	4,534	4,536	4,636
<b>Hispanic American</b>	2,057	213	241	273	280	294	300
<b>Native American</b>	140	227	227	251	282	273	258
<b>Pacific Islander</b>	12	891	900	884	972	1,008	1,036
<b>Total Minority</b>	7,427	5,706	5,674	5,706	6,068	6,111	6,230
<b>Non-Minority</b>	18,634	13,477	12,132	11,285	11,775	12,019	11,777
<b>Total-All</b>	26,061	19,183	17,806	16,991	17,843	18,130	18,007

**Baseline**

<b><u>Degrees</u></b>	<b>Spr. '95</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>African American</b>	877	658	753	773	726	810	707
<b>Hispanic American</b>	345	36	42	53	48	60	46
<b>Native American</b>	23	40	37	53	51	49	36
<b>Pacific Islander</b>	4	230	218	239	222	245	245
<b>Total Minority</b>	1249	964	1050	1,118	1,047	1,164	1034
<b>Non-Minority</b>	4,641	2,975	2,883	2,706	2,546	2,559	2,645
<b>Total-All</b>	5,890	3,939	3,933	3,824	3,593	3,723	3,679

**GRADUATE SCHOOL TRANSITION**

	<b>Level I</b>		<b>Level II</b>	
	<b>1999-2000</b>	<b>2000-2001</b>	<b>1999-2000</b>	<b>2000-2001</b>
<b>African American</b>	32	24	36	66
<b>Hispanic American</b>	6	3	2	7
<b>Native American</b>	1	0	1	1
<b>Pacific Islander</b>	0	0	0	0
<b>Minority</b>	1	0	0	0
<b>Non Minority</b>	0	0	2	99
<b>Unknown</b>	0	0	0	1
<b>Total-All</b>	40	27	41	174

\*Level I students receive direct financial support from LSAMP.

\*Level II students do not receive LSAMP direct funds.

**RETENTION DATA**

	<b>SMET</b>			<b>NON-SMET</b>		
	<b>Total in Cohort</b>	<b>1-Year Return</b>	<b>%Total</b>	<b>Total in Cohort</b>	<b>1-Year Return</b>	<b>% Total</b>
<b>1994</b>	781	549	70.34%	3,360	2,551	75.92%
<b>1995</b>	850	594	69.88%	3,246	2,492	76.77%
<b>1996</b>	847	604	71.31%	3,551	2,712	76.37%
<b>1997</b>	859	608	70.78%	3,643	2,829	77.67%
<b>1998</b>	938	600	63.97%	3,598	2,730	75.88%
<b>1999</b>	882	574	65.08	3,821	2,780	72.76%

## **ALLIANCE MANAGEMENT/JOINT PLANNING AND DEVELOPMENT**

Program Management for the Alliance includes a structural organization plan and a communication/dissemination plan for coordination of project activities. The daily operation and management of the Alliance is accomplished through the Project Director, Co-Project Director/Associate Executive Director, a full-time NC-LSAMP Coordinator, and a Program Assistant based at North Carolina A&T State University. Each of these individuals serves on the Alliance Executive Committee. The Alliance Coordinator disseminates information and materials, and interacts with campuses frequently, often daily via e-mail, telephone, and fax, to guarantee congruence relative to all Alliance-wide initiatives. In addition, a campus-level coordinator at each institution ensures coherence of programs and activities. Campus-level program coordinators are also members of the Executive Committee.

Executive Committee meetings are held quarterly at partner campuses on a rotating basis, and additional meetings are conducted when necessary to address operational matters in a timely manner. In addition, standing Program Sub-Committees of the Executive Committee and other faculty involving a representative from each SMET department (chairperson and/or faculty members), e.g., Research Conference Planning Committee, Undergraduate Research Planning Committee, Teacher Preparation Coordinating Committee, etc. are held as often as required in conjunction with planned activities. The Advisory Board, composed of the Chancellors of each partner institution, is responsible for reviewing all aspects of Alliance operations and activities and ensuring that project objectives are accomplished. Dr. James C. Renick, chancellor, North Carolina A&T State University, replaced Dr. Edward B. Fort as NC-LSAMP Advisory Board Chairman effective July 1999. The Advisory Board meets at least once annually. Chancellor Renick represented the Advisory Board most recently during a NC-LSAMP Executive Committee meeting held at the NCA&TSU campus.

## **TRAINING AND DEVELOPMENT:**

### **3. Training and Development:**

Primary Alliance efforts in training and development have been fostered and promoted through the Collegiate Curriculum Reform and Community Action (CCRCA) Initiative. The major goal of CCRCA was to provide training for calculus teachers to facilitate incorporation of graphing calculators into the instructional program. The Mathematical Association of America coordinated strategies pertaining to "best practices" for developing teacher training and involvement of Minority Serving Institutions (MSIs). Texas Instruments donated classroom overhead view screens with instructional calculators, and provided classroom sets of 30 TI92 graphing calculators at \$70 each compared to a typical market value price of \$200 each for 17 professors, who completed the CCRCA IV Training Program. This equipment was available for use by students at no cost for the duration of each semester.

In 1994, the National Science Foundation (NSF) initially funded CCRCA as a supplement to the NC-LSAMP Project. Although funding by the agency for this special initiative officially ended October 31, 1998, key components of CCRCA were successfully institutionalized, and continue to impact calculus teaching and learning across 35 MSIs, (28 Historically Black Colleges and Universities, 5 Hispanic serving institutions, 1 tribal college, and 1 Native American serving university), including 4 of the NC-LSAMP partner universities.

Operation of campus-based staff development activities during the 2000-2001 academic year supported calculus reform efforts facilitated by 83 well-trained professors at the 35 participating schools. These faculties continue to effectively utilize classroom sets of state-of-the-art graphing calculators, and share their specialized knowledge and skills with colleagues and students. At the outset of CCRCA, specific objectives were aimed at attracting more students from underrepresented groups into SMET majors by developing and implementing activities using modern, effective techniques for introducing students to calculus. Through institutionalization and continued expansion of related calculus reform activities at CCRCA schools, the total cumulative impact now exceeds 7,000 students annually. Consequently, the total cumulative impact of CCRCA is currently 153 science and mathematics faculty, and 31,000 students. Data indicate that 20% fewer students withdraw from calculus courses incorporating the technology, while a 25% increase is reflected by the course passing rate with a grade of C or above.

SMET Teacher Preparation faculty development activities were initiated during the 1997-1998 academic year in conjunction with the Teacher preparation component. NSF funding for this special supplement to the NC-LSAMP Project officially ended October 31, 1998. In the spring of 1998, mathematics and science faculty at four institutions (North Carolina A&T State University, Fayetteville State University, North Carolina Central University, and the University of North Carolina at Pembroke) participated in PRAXIS teacher education workshops. The overriding goals of the workshops were to increase faculty and student awareness of the nature of the new PRAXIS Series: Professional Assessments for Beginning Teachers (Educational Testing Service, 1996). These tests are mandatory relative to state licensing requirements. All phases of the faculty development model were completed: faculty in biology, chemistry, physics, and mathematics reviewed national PRAXIS examinations; identified and aligned the curriculum with test concepts and specifications; developed items for a test bank; and produced tests similar to the national test. Workshops for reviewing tests were conducted by a consultant from ETS. Faculty continue to utilize test item banks and simulated examinations to prepare students for actual testing situations. The impact of workshops, training, and special materials on actual test performance will be determined by a follow-up study in progress.

## OUTREACH ACTIVITIES

### **4. Outreach Activities:**

Primary outreach activities implemented by the NC-LSAMP to increase public understanding of and participation in science and technology have been achieved in conjunction with university recruitment efforts. Specifically, partner institutions routinely disseminate and discuss literature describing opportunities provided by the Alliance. These recruitment/sharing sessions are conducted at high schools throughout North Carolina. Partners have formed effective work relationships with high school guidance counselors, who assist with identification of prospective students for Alliance Bridge Programs. SMET faculty and administrators have expanded recruitment activities typically utilized by admissions officers. Since the inception of the Alliance, Native American participation in SMET degree programs has increased significantly as a result of intensive involvement of Native American parents in recruitment activities. Additionally, the Alliance Coordinator meets annually with community college students, faculty, and administrators to share information about SMET degree programs and careers in these technical fields. During the past four years, high school and community college students and faculty have been invited to participate in the Undergraduate Student Research Conference sponsored by the Alliance.

**Journal Publications:****Book(s) or other one-time publication(s):****Other Specific Products:****Internet Dissemination:**

[www.eng.ncat.edu/~ncamp](http://www.eng.ncat.edu/~ncamp)

**Description:**

The NC-LSAMP Web site is primarily used to present an Alliance-wide overview of the goals and program services available to support undergraduate students pursuing a baccalaureate degree in a SMET discipline. Partner institutions are indicated along with SMET enrollment and degree data, highlights of program effectiveness, and overall accomplishments. Currently, the Web site is under construction for expansion to reflect collaborative activities for students relative to all available diversity-focused programs in the NSF SMET continuum: LSAMP, HBCU-UP, CREST, and MGE.

**Contributions:****Contributions within Discipline:**

The North Carolina Louis Stokes AMP Project has focused on science, mathematics, engineering, and technology (SMET) fields. Throughout the Alliance, instruction in SMET courses has emphasized 'hands-on' collaborative techniques to enhance student success in gatekeeper courses. The most significant findings thus far are related to outcomes associated with curriculum reform, particularly in calculus instruction. Specialized training provided for calculus teachers through the Collegiate Curriculum Reform and Community Action (CCRCA) Initiative, resulted in effective incorporation of graphing calculators into the instructional program. The Mathematical Association of America coordinated strategies pertaining to best practices for developing teacher training and involvement of Minority Serving Institutions (MSIs). Texas Instruments donated classroom overhead view screens with instructional calculators and provided classroom sets of 30 TI-92 graphing calculators at \$70 each compared to a typical market value price of \$200 each for 17 professors who completed the CCRCA IV Training Program. This equipment was provided for free use by students for the duration of each semester. NSF funded CCRCA as a supplement to the NC-LSAMP; however, funding by NSF for this special initiative officially ended October 31, 1998.

Without funding during the 2000-2001 academic year, operation of campus-based staff development activities supported calculus reform efforts facilitated by 83 well-trained professors at the 35 participating schools. These faculties continue to effectively utilize classroom sets of state-of-the-art graphing calculators, and share their specialized knowledge and skills with colleagues and students. At the outset of CCRCA, specific objectives were aimed at attracting more students from underrepresented groups into SMET majors by developing and implementing activities using modern, effective techniques for introducing students to calculus. Through institutionalization and continued expansion of related calculus reform activities at CCRCA schools, the total impact now exceeds 7,000 students annually. Consequently, the total cumulative impact of CCRCA is currently 153 science and mathematics faculty, and 31,000 students. Data indicate that 20% fewer students withdraw from calculus courses incorporating the technology, while a 25% increase is reflected by the course passing rate with a grade of C or above.

**Special Requirements for Annual Project Report:**

*Unobligated funds: less than 20 percent of current funds*

**Categories for which nothing is reported:**

**Products:** Journal Publications

**Products:** Book or other one-time publication

**Products:** Other Specific Product

**Contributions to Other Disciplines**

**Contributions to Education and Human Resources**

**Contributions to Resources for Science and Technology**

**Contributions Beyond Science and Engineering**

**Special Reporting Requirements**

**Animal, Human Subjects, Biohazards**