

OKLAHOMA



NATIONAL SCIENCE FOUNDATION



# LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION



## 19 YEARS OF IMPACT 1994-2013

# OKLAHOMA

LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

IN SCIENCE, TECHNOLOGY, ENGINEERING

AND MATHEMATICS

(OK-LSAMP)

## A HISTORY OF SIGNIFICANT EVENTS

1994-2013

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## INTRODUCTION

In 1992, the Oklahoma State Regents, under the leadership of Chancellor Hans Brisch and Vice Chancellor Joe Hagy, organized the Oklahoma Alliance for Minority Participation in Science Engineering and Mathematics (OKAMP-SEM). This alliance consisted of the institutions of higher education in Oklahoma. Dr. Earl Mitchell, Oklahoma State University Professor, was chosen to serve as Chair of the Alliance. In 1993, Dr. Mitchell, with the help of Dr. Ann Ackerman, South Oklahoma City Junior College, wrote and submitted an application to the National Science Foundation for the support of an Alliance for Minority Participation (AMP) in Science, Engineering and Mathematics programs for the Oklahoma Alliance with matching funds from the Oklahoma State Regents for Higher Education to support the regional universities.

In 1994, Oklahoma State University (OSU), as the lead institution, along with seven partner institutions, was awarded a grant from the National Science Foundation (NSF) for the *Alliance for Minority Participation (AMP)*. The program was established to address the critical undersupply of minority students pursuing Bachelor of Science degrees in Science, Mathematics, Engineering, and Technology (SMET). Today, 11 Oklahoma institutions of higher education make up the Oklahoma consortium. During the 19 years Oklahoma has been active, several events have taken place – events that are reflected by a change in the name to include Congressman Louis Stokes as part of the title (Louis Stokes Alliance for Minority Participation-LSAMP), the addition of universities to the consortium, and the increase of students being retained in the STEM disciplines and many continuing on to graduate school.

The Oklahoma Alliance began under the direction of Dr. Earl Mitchell and continued for 13 years until his retirement from Oklahoma State University in 2007. Currently, Dr. Jean Van Delinder, Oklahoma State University, serves as the Principal Investigator/ Program Director for both the LSAMP program and for the Bridge to the Doctorate (BD) initiative. Oklahoma State University serves as the lead institution for the Oklahoma Alliance and for the Bridge to the Doctorate initiative. Currently, OSU and the University of Oklahoma (OU) have Bridge to the Doctorate (BD) programs.

The Oklahoma Alliance began with a baseline of 214 under-represented minority (URM) students completing requirements for the Bachelor of Science degree in the STEM disciplines. The 2012 data reported 770 URM students completed degree requirements, indicating a 260 percent increase since the program began in 1994. Oklahoma has positively impacted student achievement for 19 consecutive years.

## **Historical Highlights of the Oklahoma Alliance Program**

### **PHASE 1: 1994-1999**

The *Oklahoma Alliance for Minority Participation in Science, Mathematics, Engineering and Technology (OKAMP-SMET)*, formed under the leadership of Oklahoma State University and the Oklahoma State Regents for Higher Education. It was established to address the critical under-supply of minority students at state higher education institutions receiving science, technology, engineering and mathematics (STEM) degrees. Participating institutions included 3 research universities – Oklahoma State University (OSU), The University of Oklahoma (OU), and the University of Tulsa (TU); Oklahoma’s Historically Black University – Langston University (LU); one large metropolitan and urban university – University of Central Oklahoma (UCO); 9 regional universities of the state system; 11 two-year colleges, including Bacone College – a private American Indian College (became a 4-year institution in 2001); and 3 other private colleges and universities.

- |   |
|---|
| <ul style="list-style-type: none"><li>◆ Oklahoma LSAMP formed in 1993</li><li>◆ NSF funding awarded in 1994</li><li>◆ Alliance programs initiated in 1995</li></ul> |
|---|

Three programs were established for students pursuing Baccalaureate degrees. The program areas were:

1. *Scholarship* – This program was initially active during the fall and spring semesters with minimal support during the summer term. The intended outcome of this support was to reduce the students’ overall level of indebtedness at the conclusion of the baccalaureate degree program, thus minimizing financial limitations to entering graduate study. Scholarships lead to the students being paired with faculty mentors to conduct research. Faculty mentors played a substantial role in the success of the students.

2. *Summer Internship* – The internship program was used to develop serious interest in graduate training and a realistic picture of “what scientists actually do.” The experience of working closely with other researchers provided encouragement for continued education in chosen career fields.

3. *Summer Bridge for Rising Freshmen* – The residential program was held on the Oklahoma State University campus and provided rising college freshmen with an



advance start of two “gateway” courses – College Algebra and English Composition. High school seniors from across the state of Oklahoma were recruited and eligibility determined with 35 students chosen for the initial program.

In addition to the three major programs developed, a *Teacher Preparation Initiative Program* was implemented in 1996 as a supplement to the original proposal. The program focus was to help increase the number of minority teachers in grades K-12 having preparation in the science and mathematics fields.

Phase I of the program (1994 -1999) was comprised of the following: Dr. Earl Mitchell, Principal Investigator/ Program Director, Oklahoma State University and 8 Partner institutions -- *Oklahoma State University* (OSU Lead Institution), *University of Oklahoma* (OU), *Langston University* (LU), *East Central University* (ECU), *University of Central Oklahoma* (UCO), *Northwestern Oklahoma State University* (NWOSU), *Southeastern Oklahoma State University* (SEOSU), and *Northeastern State University* (NSU). Administrative staff job descriptions were created and individuals were chosen to fill these positions. In addition, a campus coordinator was selected to represent each campus.

Table 1. Beginning Administrative Staff and Campus Coordinators

Person	Position
Earl D. Mitchell, Ph.D.	Principal Investigator/ Program Director
Judy Batson, Ph.D.	Program Manager
Yousif Sherif, Ph.D.	Program Data Manager
Carl Rutledge, Ph.D.	Co-Principal Investigator, ECU Campus Coordinator
Kathy Niblett, M.S.	ECU Campus Coordinator
Phillip Schapiro, Ph.D.	Co-Principal Investigator, LU Campus Coordinator
Myron Cherry, Ph.D.	Co-Principal Investigator, NSU Campus Coordinator
Carol Rhoads, M.S.	NSU Campus Coordinator
Billy Stewart, Ph.D.	Co-Principal Investigator, NWOSU Campus Coordinator
Valerie Shangreaux, M.S.	OSU Campus Coordinator
Wayne Steen, Ph.D.	Co-Principal Investigator, OU Campus Coordinator
Sydney Jones, M.S.	OU Campus Coordinator
James Lester, Ph.D.	SEOSU Campus Coordinator
S. N. Rao, Ph.D.	Co-Principal Investigator, UCO Campus Coordinator
David Boliver, Ph.D.	UCO Campus Coordinator

## Job Duties

The Program Director was assigned: oversight of the program administration and management, strategic planning and goal setting, policy decision-making, leadership and interfacing with leadership of funding agencies and the governing board, and to convene meetings of partner institutions.

The Program Manager duties were to: serve as assistant to the Program Director, designee for the Director when absent, maintain on-going program operations, maintain program integrity and cohesion, lead efforts to develop and initiate LSAMP programs, seek to form cooperative associations with other programs or initiatives.

The Data Manager: established, maintained, and analyzed data on participants and mentors and also established and maintained communications for collection and dissemination of information.

The Program Evaluator: performed a comprehensive assessment of the program effectiveness and assisted in developing ways to meet state, regional, and national STEM goals.

The Campus Coordinators: were to have oversight of the programs on their respective campuses, work cooperatively with other LSAMP personnel, recruit scholars into the program, and monitor/guide scholar progress.

After initial funding was received from the National Science Foundation (NSF), the program director, administrative staff, and campus coordinators met to design and select a logo for the program (Figure 1). The logo was to be used on publications from the Alliance, be placed on student research project/posters for presentations, and allow for easy identification of the program.

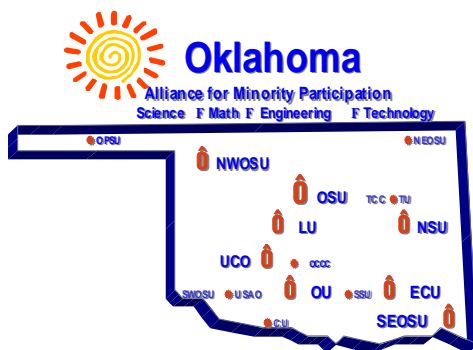


Figure 1. Original Logo for the Oklahoma Alliance.

## Historical Goals/Objectives of Program

The Oklahoma LSAMP program aimed to increase the number of students from under-represented populations receiving baccalaureate degrees in STEM fields, thus creating a critical mass of potential STEM graduate students from underserved groups. Additionally, the cultural change was described as “changing students from a concept of vocation or immediate job when completing the Baccalaureate degree to one of planning for graduate education.” The program began with a baseline of 214 students from Alliance institutions. Toward realization of these goals, the program designed activities to incorporate:

1. Avenues for identifying and recruiting qualified students.
2. Summer bridge programs designed to orientate students to college life, coursework, and ‘survival’ skills prior to the beginning of the fall semester and the presence of the entire student body.
3. Retention efforts afforded through academic mentoring, academic support, social support, and staff availability.
4. Collaboration with campus support programs, external community organizations, and tribal offices.
5. Research opportunities with faculty mentors.

The following figures show the 1995 distribution of OKAMP participants by institution, ethnicity, and gender:

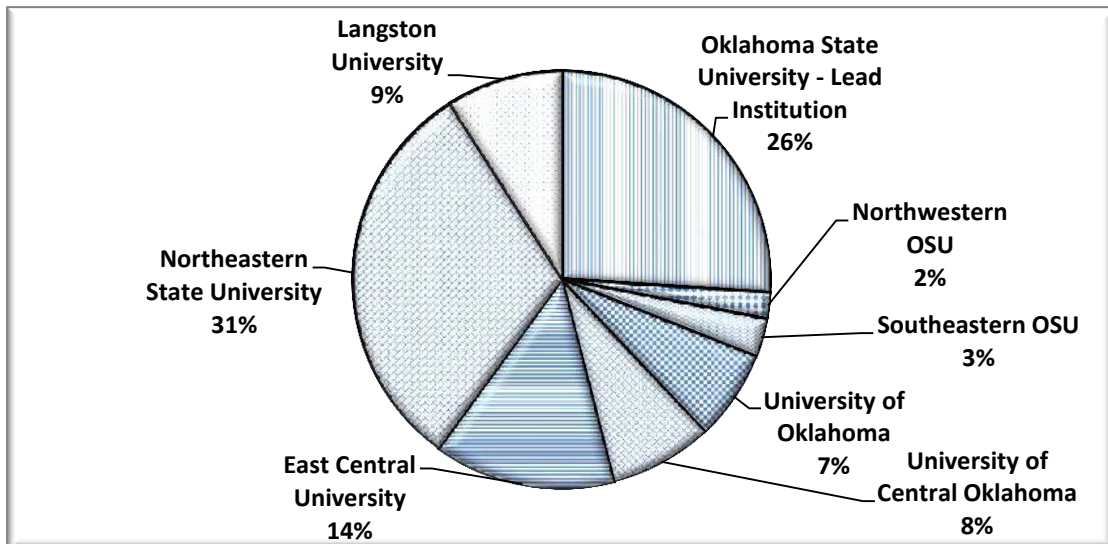


Figure 2. 1995 Distribution of Participants by Partner Institutions.

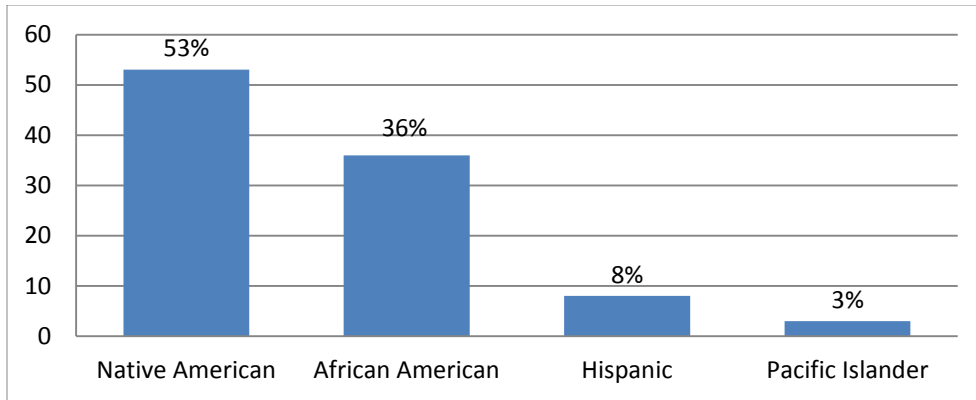


Figure 3. 1995 Percentage of Participants by Ethnicity.

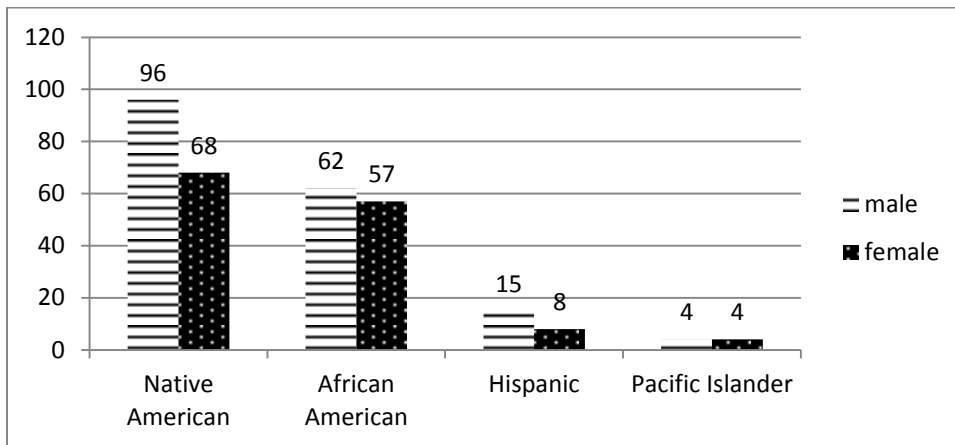


Figure 4. 1995 Distribution of Participants by Gender and Ethnicity.

### Name Change

In December 1998, the United States Congress enacted a name change for the AMP Program. The name of Louis Stokes, a former Congressman from Ohio and supporter for minority programs, was added to the official title. Congressman Stokes served as an advocate for the poor and disadvantaged. He sponsored legislation to help people of color which included the sponsorship of programs for minority professionals in health and science and engineering at the National Institutes of Health and the National Science Foundation. After this legislation, each state was allowed to add their state name to the beginning of the title; therefore on December 17, 1998, the *Oklahoma Louis Stokes Alliance for Minority Participation (OK-LSAMP)* became officially recognized.

### Alliance Success in Phase I

Phase I graduation rates exceeded the goals set forth in the proposal. Retention rates were up from 75.6 percent to 83.4 percent for under-represented minorities in STEM disciplines, and the average GPA of the scholars was 3.2. Additionally, the Alliance joined forces with the Experimental Program to Stimulate Competitive Research (EPSCoR) to recruit high school junior and senior students for a multi-state conference on science and mathematics. The two-day conference in Lawrence, Kansas, was designed to provide under-represented minorities with information about developing science-related interests, learning more about science fields, and preparing for college.

### Student Success in Phase I

At the conclusion of Phase I, the outside evaluator discovered that the 1994 freshman class participants had a higher retention rate. Thus, it was concluded that under-represented minority students were retained at a higher level than before the establishment of the Oklahoma AMP program. The program showed a 47 percent increase from year 1 to year 5 in the number of minority degrees awarded. In addition to generating an increase in degrees earned, the OKAMP program influenced the overall academic culture by encouraging more high quality undergraduate research experiences for a broader pool of students.

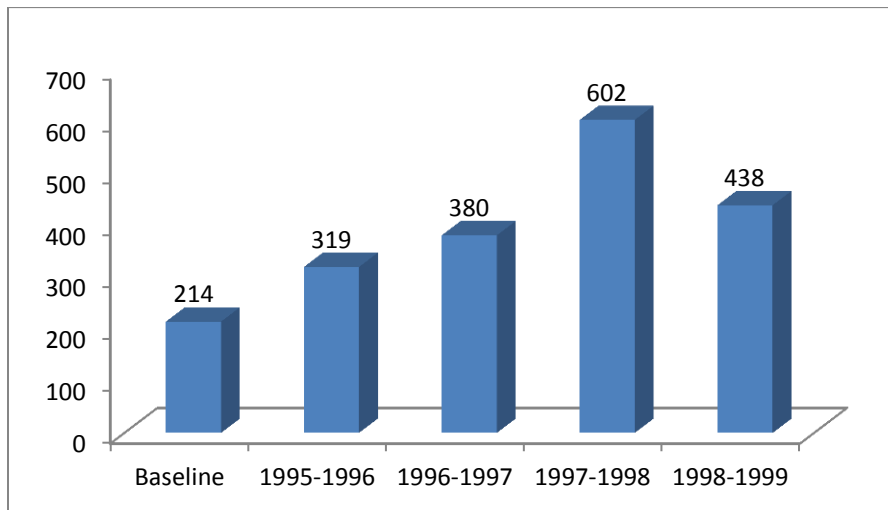


Figure 5. Number of Bachelor of Science URM Degrees Awarded During Phase I.

**PHASE II: 1999-2004**

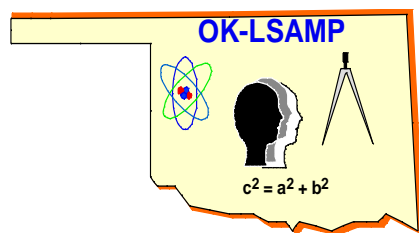
Phase II of the program (1999 -2004) was proposed to emphasize the preparation of minority scholars for graduate education. The major objectives for Phase II were to expand the number of partner institutions from eight to 11 in order to reach more students; expand research experiences through academic year activities with more off-campus and non-academic research sites; increase early preparation for graduate studies through workshops and orientations; establish summer transfer bridge programs with two-year affiliates; and offer a clear and specific discipline-related teacher preparation component to students seeking a degree.

The Phase II program comprised of the following: *Oklahoma State University* (Lead Institution) and 10 Partner institutions -- *University of Oklahoma* (OU), *University of Tulsa* (TU), *Langston University* (LU), *Cameron University* (CU), *East Central University* (ECU), *University of Central Oklahoma* (UCO), *Northwestern Oklahoma State University* (NWOSU), *Northeastern State University* (NSU), *Southeastern Oklahoma State University* (SEOSU), and *Southwestern Oklahoma State University* (SWOSU). Administrative staff and campus coordinators for Phase II were selected (see Table 2).

Table 2. Phase II Administrative Staff and Campus Coordinators

Person	Position
Earl D. Mitchell, Ph.D.	Principal Investigator/Program Director
Rosemary Hayes, Ph.D.	Evaluator, Center for Institutional Data Exchange & Analysis
Zola Drain, Ph.D.	Program Manager
Yousif Sherif, Ph.D.	Program Data Manager
Carl Rutledge, Ph.D.	Co-Principal Investigator, ECU Campus Coordinator
Kathy Niblett, M.S.	ECU Campus Coordinator
Ted Snider, Ph.D.	CU Campus Coordinator
Phillip Schapiro, Ph.D.	Co-Principal Investigator, LU Campus Coordinator
Myron Cherry, Ph.D.	Co-Principal Investigator, NSU Campus Coordinator
Carol Rhoads, M.S.	NSU Campus Coordinator
Billy Stewart, Ph.D.	Co-Principal Investigator, NWOSU Campus Coordinator
Valerie Shangreaux, M.S.	OSU Campus Coordinator
Wayne Steen, Ph.D.	Co-Principal Investigator, OU Campus Coordinator
Sydney Jones, M.S.	OU Campus Coordinator
Tim Patton, Ph.D.	SEOSU Campus Coordinator
Brian Campbell, Ph.D.	SWOSU, Campus Coordinator
J. C. Diaz, Ph.D.	Co-Principal Investigator, TU Campus Coordinator
S. N. Rao, Ph.D.	Co-Principal Investigator, UCO Campus Coordinator
David Boliver, Ph.D.	UCO Campus Coordinator

Following an initial meeting of the campus coordinators and the Principal Investigator, a new program logo was developed with the name change in mind. The logo was to reflect the overall goals of the Oklahoma consortium, “*LS-OKAMP is a consortium of colleges and universities within the State of Oklahoma developing programs aimed at substantially increasing the quantity and quality of students from under-represented populations receiving degrees in Science, Mathematics, Engineering, and Technology. In the first 5 years or Phase I (1994-1999), more than 640 Native American, African American, Hispanic, and Native Pacific Islander undergraduates participated in the High School-to-College Summer Bridge Program, Scholars Program, and Summer Research Internship Program. Phase II goals (2000-2004) aim to expand the research experience throughout the academic year; incorporate a 2-to-4-Year College Bridge Program, provide a Teacher Preparation component for OKAMP participants who anticipate college-level faculty positions, and emphasize preparation for graduate school admission and success*” (Figure 6).



1999-2000



2000-2003

Figure 6. LS-OKAMP Logos.

Phase II began with a baseline graduation rate of 438 compared to the 1994 Phase I baseline of 214. Over a 5-year period, URM baccalaureate degrees increased by 50% (Figure 7).

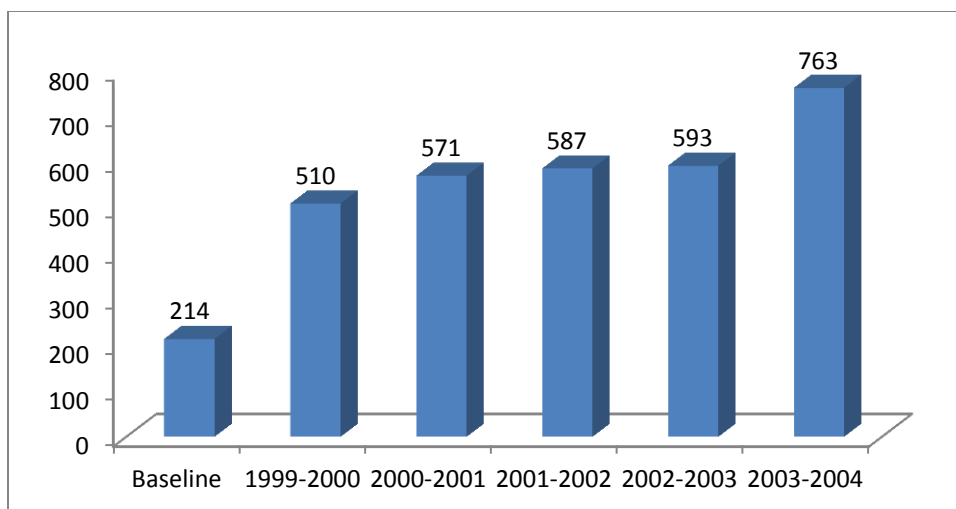


Figure 7. Number of Bachelor of Science Degrees Awarded During Phase II.

### Student Success in Phase II

Student success was evident at all Alliance institutions. Scholars were awarded paid summer internships and several had articles published in peer reviewed journals. Additionally, some research activities led to the development and patent of inventions. Selected examples are listed:

**Paul De La Cerda** was named one of Oklahoma State University's Top Ten Seniors for 2000. In addition, he was included in the National Hispanic Student Leader of the Year and Minority Engineer of the Year Award. He received a patent for his *Pooch Pass Home Security Pet Door* and is President and CEO of Pooch Pass, Inc. Paul was also selected as a Los Angeles 40 Under 40 Award and one of the 51 most influential people in Santa Clarita Valley. He also became the first Hispanic elected school board member for Saugus Union School District, California.

**Desmond Harvey**, received a Bachelor of Science degree in Chemistry from Langston University and a Master of Science degree as a Bridge to the Doctorate Fellow at the University of Oklahoma. After completing his MS degree, he took a job in industry and has recently returned to complete Ph.D. requirements and serve as the Coordinator of Multicultural Engineering Programs (MEP) at Oklahoma State University.

**Cara Cowan Watts**, received her Bachelor of Science degree in 1997 and her Master of Science degree in 2002 from Oklahoma State University. She is currently completing requirements for the Ph.D. in Biosystems and Agriculture Engineering as a Cohort I BD Fellow. Cara is serving as an elected Councilwoman for the Cherokee Nation and Deputy Speaker for the Cherokee Tribal Council. Cara has represented the



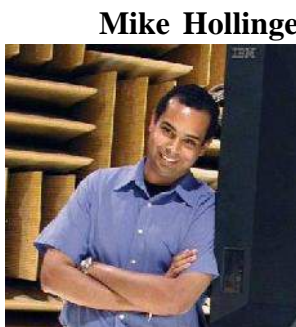
Cherokee Nation and other Native Americans on various state and national committees regarding health care and water rights.

**Dr. Daniel H. Wilson**, University of Tulsa Scholar, has two Master of Science degrees and a Ph.D. from Carnegie Mellon University. During his undergraduate years, Daniel was awarded a graduate engineering fellowship from the National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM). He formed a software company that designed and distributed a program to area home healthcare providers to manage patient conditions and visiting schedules. Daniel has numerous books published, had a TV show on the History Channel, and has sold the movie rights to several of his books including his first book, *How to Survive a Robot Uprising*. In addition, he has written books for young adults and a screenplay for Nickelodeon Movies. November 2012, Daniel was rated one of “Hollywood’s 25 Most Powerful Authors” by the Hollywood Reporter.



**Tambra Stevenson**, Oklahoma State University Scholar, received her Bachelor’s Degree in Human Nutrition. She earned her Master’s Degree in Health Communication from Tufts School of Medicine/Emerson College Joint Program. Tambra has also completed course work in Health Care Marketing and Entrepreneurial Management at Boston University Graduate School of Management. She completed internships at Hill Holiday, CBS Healthwatch, the 2003 Ad Club of Boston Summer Internship Program, and the Boston Black Women’s Health Institute. Tambra’s master’s project was the YO! Health Study which created a youth-centered multicultural health career website for the Tufts public health program. She also began the project “Postcards from Katrina” to aid hurricane victims.

**Kara & Levisa Chapman**, twin sisters, and scholars from East Central University were two of 18 nationally to receive the National Society of Physics Students Scholarship. Their project was to create a video about Einstein’s Twin Paradox. The sisters completed requirements for the Bachelor’s degree in Physics and are currently enrolled in Ph.D. programs at Texas A&M University.



**Mike Hollinger** received his Bachelor’s degree in Computer Engineering from the University of Oklahoma (OU). Completing the five-year accelerated BS/MS program in 2005, he received his Master’s Degree in Electrical & Computer Engineering. Following graduation, Mike joined IBM’s Systems & Technology Group, working in IBM’s Austin, Texas, design center. He currently specializes in embedded systems firmware for the IBM System I&P lines of servers. Since joining the company, Mike has

several patents pending. In addition to his "day job," Mike is also an officer of IBM Austin's Emerging Technology and Business Innovation group leading periodic invention roundtables and brainstorming sessions. Mike currently serves as a member of the Dean's Advisory Board on Diversity (DABD) at OU and serves as alumni reviewer for the Student Organization Website Competition.

**Dr. Jennifer McLoud-Mann** received her Bachelor's degree in Mathematics from East Central University in 1997. She received her Master of Science and Ph.D. from the University of Arkansas also in Mathematics. Since 2002, she has been at the University of Texas-Tyler. Dr. McLoud-Mann is an Associate Professor of Mathematics and Associate Dean of the College of Arts and Sciences. In 2008, Jennifer was recognized by the Texas Section of the Mathematical Association of America with the Faculty Award for Outstanding Contributions to students and in 2009, she was one of three professors to receive a national teaching award through the Mathematical Association of America.

**Jade Verdeman** received his Bachelor of Science degree in Cell Biology from Northeastern State University. He received his Master of Science degree in Entomology from Kansas State University and currently owns and operates Moses BioLogic, LLC, a company specializing in testing food packaging's tolerance to insects.

### Alliance Accomplishments

During Phase II, the Oklahoma Alliance developed Graduate Record Exam (GRE) preparation modules. The modules emphasized: (1) what is the GRE, (2) format and content, (3) why take the GRE, (4) when and where to take the GRE, (5) how to prepare for the exam, (6) test-taking skills and strategies, (7) practice exams, and (8) costs. Regular meetings and workshops were held throughout the alliance by the OSU Graduate College representative and OK-LSAMP staff. Students were required to complete a minimum of two graduate school applications to institutions of their choice.

Campus Coordinator Valerie Shangreaux was named *an Inaugural Year Gates Millennium Scholar*. Valerie is a member of the Oglala Sioux Tribe. She completed requirements for the doctoral degree in Educational Psychology while working with the Oklahoma Alliance as OSU Campus Coordinator. Currently, she serves as Director of Leadership with the Blandin Foundation in Minnesota.

Three former scholars completed Ph.D. degrees in Mathematics, Biology, and Electrical Engineering. Five scholars were enrolled in Ph.D. programs in the areas of Biochemistry, Computer Science, and Chemistry.

Oklahoma Alliance campuses hosted summer bridge programs for each of the summers in Phase II. The bridge programs provided eligible minority students with a jump start on college courses and experiences, as they made the transition from high

school to college. Students were immersed into college life through on campus courses, living in dorms, and participating in social/leadership activities.

The Oklahoma Alliance submitted a proposal to the National Science Foundation for Phase III of the LSAMP award. The grant was awarded to Oklahoma to begin in October 2005. The focus of the grant was on graduate preparation and entrance into graduate programs.

NSF initiated the Bridge to the Doctorate (BD) initiative in fiscal year 2003 as a supplement for Phase III alliances. The program, aimed to ease the transition from undergraduate study to the next level, provided competitive support during the initial two years of graduate study and broadened the opportunity for minority participation in STEM disciplines. In July 2004, Oklahoma LSAMP received funding for the new initiative with Oklahoma State University as the BD site. Twelve fellows were selected for the inaugural cohort.

### **PHASE III: 2004--2009**

Phase III of the program (2005 -2009) was proposed to emphasize the recruitment and retention of minority students as well as preparation for graduate education. The program focused on research activities in the last two years of the undergraduate degree. In addition to forming a strong research experience, scholars were encouraged to participate in two summer research experiences before receiving their BS degree.

The Phase III program continued to be comprised of the following eleven partner institutions: *Oklahoma State University* (OSU Lead Institution), *University of Oklahoma* (OU), *University of Tulsa* (TU), *Langston University* (LU), *Cameron University* (CU), *East Central University* (ECU), *University of Central Oklahoma* (UCO), *Northeastern State University* (NSU), *Northwestern Oklahoma State University* (NWOSU), *Southeastern Oklahoma State University* (SEOSU), and *Southwestern Oklahoma State University* (SWOSU).

In 2007, Dr. Earl Mitchell retired from Oklahoma State University and therefore left the OK-LSAMP program as Principal Investigator/Director. Dr. Cornell Thomas, Vice President for Institutional Diversity was appointed as the Principal Investigator and Director for both the LSAMP and BD programs. Dr. Gordon Emslie, Dean, OSU Graduate College, was appointed as Co-Principal Investigator of the BD program. In 2009, Dr. Emslie was appointed Principal Investigator/Director of both the LSAMP and BD programs when Dr. Thomas left Oklahoma State University. In addition to changes in the Principal Investigator, the staff changed to include only the Program Manager and Data Manager. Several changes also occurred in the positions of the Campus Coordinators (Table 3).



Earl Mitchell, Jr.  
PI: 1994-2007

Cornell Thomas  
PI: 2007-2009



Gordon Emslie  
PI: 2009-2010

Table 3. Phase III Administrative Staff and Campus Coordinators

Person	Position
Gordon Emslie, Ph.D.	Co-Principal Investigator-BD program & PI/Director
Cornell Thomas, Ph.D.	Principal Investigator / Program Director
Earl D. Mitchell, Ph.D.	Principal Investigator / Program Director— (Retired 2007)
Rosemary Hayes, Ph.D.	Evaluator, Center for Institutional Data Exchange & Analysis
Kay Porter, M.S.	Program Manager
Fara Williams, B.S.	Program Data Manager
Carl Rutledge, Ph.D.	Co-Principal Investigator, ECU Campus Coordinator
Ted Snider, Ph.D.	CU Campus Coordinator—Retired from CU
Keith Vitance, Ph.D.	CU Campus Coordinator—Retired from OK-LSAMP
Frank White, Ph.D.	CU Campus Coordinator
Sharon Lewis, Ph.D.	LU Campus Coordinator
Myron Cherry, Ph.D.	Co-Principal Investigator, NSU Campus Coordinator—Retired
Jody Buckholtz, Ph.D.	NSU Campus Coordinator
Timothy Maharry, Ph.D.	NWOSU Campus Coordinator
Camille DeYong, Ph.D.	OSU Campus Coordinator
Simin Pulat, Ph.D.	Co-Principal Investigator, OU Campus Coordinator
Tim Patton, Ph.D.	SEOSU Campus Coordinator
Brian Campbell, Ph.D.	SWOSU Campus Coordinator—Retired from OK-LSAMP
Tim Hubin, Ph.D.	SWOSU Campus Coordinator
J. C. Diaz, Ph.D.	Co-Principal Investigator, TU Campus Coordinator
Gregory Wilson, Ph.D.	UCO Campus Coordinator

## Alliance Highlights

The OK-LSAMP logo underwent another change during Phase III. The logo was redesigned to reflect the logo of each institution in the Alliance (Figure 8). At the top of the logo is the Lead Institution, OSU, immediately to the right and left are logs of the two other research institutions in Oklahoma (OU and TU).



Figure 8. 2007 Oklahoma LSAMP Logo.

In July 2004, Oklahoma received funding to support Cohort I of the Bridge to the Doctorate program at Oklahoma State University. In July 2005, Cohort II was awarded to the University of Oklahoma. In 2008, OSU received funding for Cohort III, and in 2009 the University of Oklahoma received funding for a Cohort IV. A total of 12 fellows were chosen to participate in each Cohort at each of the schools for a total of 48 fellows being eligible to pursue higher education degrees with financial support from the National Science Foundation through OK-LSAMP.

## Bridge to the Doctorate

Cohort I: Oklahoma State University: Seven Native Americans, four African Americans, and one Hispanic former LSAMP Scholars were chosen to participate in the Bridge to the Doctorate (BD) program.

Cohort II: The University of Oklahoma: Three Native Americans, seven African Americans, and two Hispanic former LSAMP Scholars were chosen to participate in the Bridge to the Doctorate (BD) program.

Table 4. Cohort I BD Fellows

Cohort I Fellow	Discipline	Degree Progress
Barrett, Dominic	Zoology	Completed MS
<b>Cowan, Brett</b>	<b>Civil Engineering</b>	<b>Completed Ph.D.</b>
Cowan-Watts, Cara	Biosystems & Agriculture Engineering	Ph.D.: Projected 2013
Heppler, Marty	Entomology & Plant Pathology	Completed MS
<b>Manjarrez, Jacob</b>	<b>Biochemistry &amp; Molecular Biology</b>	<b>Completed Ph.D.</b>
Patton, Thomas	Electrical Engineering	Completed MS
<b>Peal, Lila</b>	<b>Biochemistry &amp; Molecular Biology</b>	<b>Completed Ph.D.</b>
Rush, Loretta	Biochemistry & Molecular Biology	Withdrew
Sherman, Adrian	Biosystems & Agriculture Engineering	Completed MS
Singleton, Nicole	Physiological Sciences	Completed MS
<b>Wilkins, Brek</b>	<b>Biomedical Sciences</b>	<b>Completed Ph.D.</b>
Wright, Cristee	Microbiology & Molecular Genetics	Completed MS



Cohort I and Cohort II Bridge to the Doctorate Fellows  
with Dr. Earl Mitchell, PI and Valerie Shangreaux, Coordinator



Table 5. Cohort II BD Fellows

Cohort II Fellow	Discipline	Degree Progress
Henderson, Jacob	Computer Engineering	Completed MS; Ph.D.: Projected
<b>Harris, Steven</b>	<b>Chemistry</b>	<b>Completed Ph.D.</b>
Harvey, Desmond	Engineering	Completed MS
<b>Hughes, Quintin</b>	<b>Industrial Engineering</b>	<b>Completed Ph.D.</b>
James, Kevin	Electrical/Computer Engr.	Completed MS; Ph.D.: Projected
McCarroll, Shawn	Computer Science	Completed MS
McCuchin, Marshall	Physics	Withdrew
Osisanya, Israel	Petroleum Engineering	Completed MS
Rowland, Marquita	Biology	Withdrew
Vasquez, William	Math	Completed MS
Wallace, T'aire	Microbiology	Transferred/another Ph.D. program
De la Cruz, Felix	Mechanical Engineering	Completed MS

Cohort III: Oklahoma State University: Six Native Americans, four African Americans, and two Hispanic, and one First Generation Female former LSAMP Scholars were chosen to participate in the Bridge to the Doctorate (BD) program.

Table 6. Cohort III BD Fellows

Cohort III Fellow	Discipline	Degree Progress
Benjamin, Marcus	Chemistry	Completed MS
<b>Blocker, Tomica</b>	<b>Zoology</b>	<b>Completed Ph.D.</b>
Carpenter, Zach	Electrical Engineering	PhD: Projected May 2014
Fine, Scott	Plant & Soil Sciences	Completed MS; Ph.D.: Projected
Gonzales, Erik	Physics	Completed MS
Gonzales, Jonathan	Electrical/Computer Engr.	Completed MS; Ph.D.: Projected
Hough, Matt	Plant & Soil Sciences	Completed MS
Hughes, Shawna	Food Sciences	Completed MS
Ngo, Minh	Forensics	Completed MS
Osei, Richard	Computer Sciences	Withdrew
Pinkerman, Cody	Aerospace/Mechanical Engr.	Completed MS; Ph.D.: Projected
Yarholar, Doug	Civil Engineering	Completed MS
Parkhurst, Molly*	Zoology	Completed MS

\*added using remaining funds through a one-year NSF approved no-cost extension.

Cohort I, II, and III Fellows have achieved the following: Degrees Awarded-- 7 Ph.D. and 23 Master of Science degrees. Seven Fellows are completing course work in Ph.D. programs with graduation dates anticipated within the next 12 months or less. Five Fellows either transferred to another Ph.D. program or withdrew from the program (Figure 9).

In addition, one BD Fellow, **Tomica Blocker**, received the Graduate Research Fellowship Program (GRFP) award to attend graduate school at Oklahoma State University. Tomica received a Bachelor of Science degree from Langston University in Biology and is on track to complete Ph.D. requirements Summer 2013. Tomica will continue her education in the Fall 2013 by attending the University of Kansas Medical School, where she will pursue an M.D. degree in pediatrics.

Cohort IV: The University of Oklahoma: Four Native Americans, five African Americans, two Hispanic, and one First Generation Female former LSAMP Scholars were chosen to participate in the Bridge to the Doctorate (BD) program.

Table 7. Cohort IV BD Fellows

Cohort IV Fellow	Discipline	Degree Progress
Aguayo, Chris	Aerospace Engineering	Withdrew to attend Air Force OCS
Atkinson, Brittanie	Biochemistry & Molecular Biology	Completed MS
Dunn, Zack	Engineering Physics	Ph.D. In progress
Franklin, Mario	Industrial Engineering	MS In progress
Herrera, Juan	Computer Engineering	Completed MS
Jordan, Lorne	Chemistry	Transferred/another Ph.D. program
Jordan, Ryan	Geology	Completed MS
Kimmel, Jason	Mechanical Engineering	Ph.D. In Progress
Liles, Meghan	Biochemistry	Ph.D. In progress
Mace, Chris	Geology	Completed MS
Moore, Crystal	Microbiology	Completed MS
Ong, Shawna	Electrical Engineering	Completed MS
Watley, Ryan	Chemistry	Ph.D. In progress



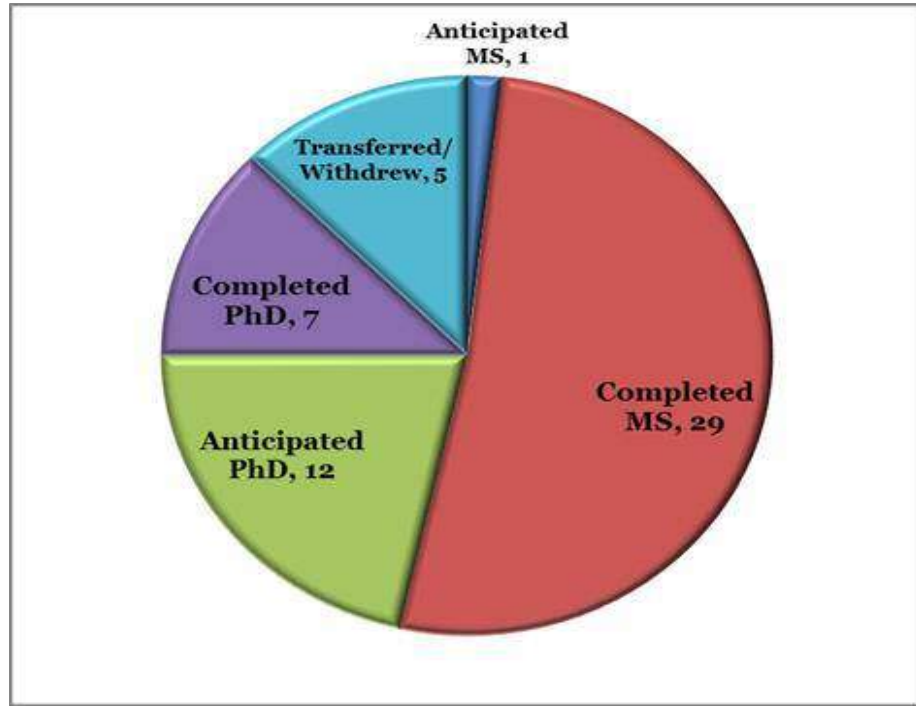
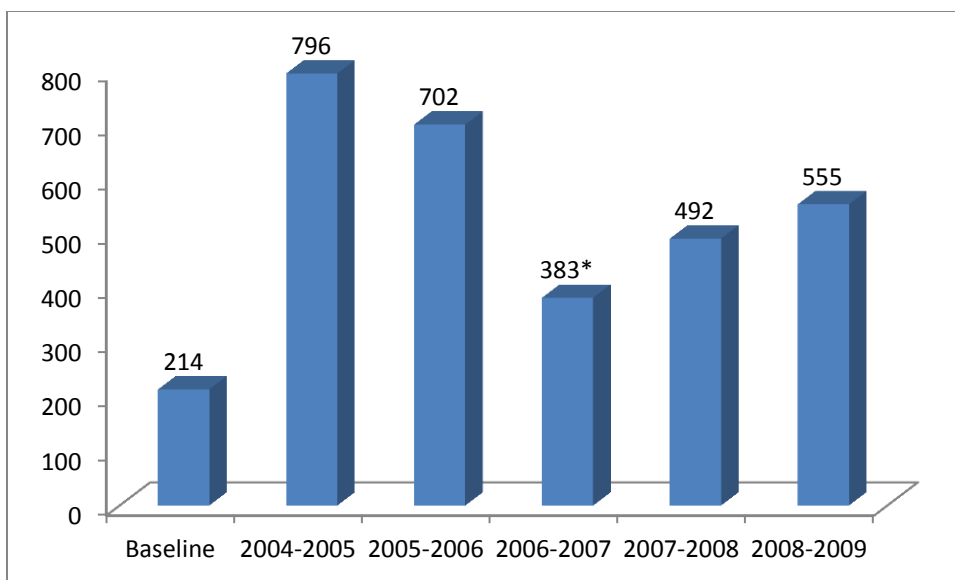


Figure 9. Cohort I, II, III, and IV Fellows.

### Student Success in Phase III

At the conclusion of Phase III, the outside evaluator reported the OK-LSAMP program was achieving stated goals. In fact, the program showed 47 percent of Phase III graduates were accepted to graduate programs. The Oklahoma Alliance continues to meet the NSF goal of increasing the number of students from historically under-represented groups completing degrees in STEM fields. Oklahoma Alliance institutions have awarded 9,144 URM degrees during the 19 years of the LSAMP program for an average of approximately 500 per year.

It should be noted the drastic change in the number of degrees awarded between 2006 and 2007 was largely due to a change in the Oklahoma State Regents for Higher Education (OSRHE) data reporting process and procedures. The current OSRHE procedures are an accurate reflection of data received by institutions.



\*After 2006, the reporting procedures for the number of STEM majors changed.

Figure 10. Number of Bachelor of Science Degrees Awarded During Phase III.

The research experience is a program benchmark in which all scholars must participate. The scholars must identify a faculty mentor, develop an approved research project, and devote time to research during the academic year. A large percentage of scholars participate in summer REU (Research Experience for Undergraduates) programs or intern with state and federal agencies and corporations across the country. For scholars remaining at their home campuses during the summer, research projects that are in progress may continue without interruption. The research experience helps to solidify the decision to pursue (or not to pursue) STEM graduate programs in preparation for research/teaching careers. By polling scholars informally, it appears that the research experience is highly valued because it provides great insight into the challenges and rewards of research. The experience requires critical thinking in the application of knowledge, builds confidence, encourages collaboration, broadens networking, and brings students in contact with outstanding researchers at some of the country's most renowned institutions and agencies. OK-LSAMP has also observed that scholars generally take advantage of every opportunity to attend conferences for the purposes of exposure and professional development, presentation of research findings, visitations with graduate school recruiters, and networking.

One major example of student research presentations has been the OK-LSAMP Annual Research Symposium. This event has been held on the Oklahoma State University campus each fall and provides an opportunity for professional and social interaction of the entire alliance. Scholars are encouraged to either present a poster or make an oral presentation on the research they have been conducting during the academic

year or the summer internship research project. The Symposium is conducted on the same level as many national conferences, with speakers, workshops, and networking opportunities.

Faculty and Student Team (FaST) Grants: During Phase III, one OSU faculty member and two scholars conducted research at Brookhaven National Labs in Long Island, New York, during the summer through FaST grants.

Scholar Publications: Phase III saw an increase in scholar publications. Scholars were represented in **13** different referred journals. T. Andrew Mixson, Zoology and Psychology double major from Oklahoma State University, had ten articles accepted for publication, three on which he was lead author. Lauren White, Environmental Sciences major from Oklahoma State University, had 6 articles accepted for publication in national journals outlining her international research on lizards.

National Scholarships: Scholars were chosen as recipients of several national scholarships. The scholarships included, but were not limited to: Gates Millennium Scholar, Graduate Research Fellowship Program, Goldwater Scholarship, Brad Henry International Scholars Program, UNCF/Merck Fellow, and UDALL Scholarships.

National Conferences: Phase III also saw an increase in the number of national conferences scholars attended as presenters. Conferences such as the National Conference on Undergraduate Research (NCUR) increased from two scholars in Phase II to 25 in Phase III. Scholars participated in the National Society of Black Engineers (serving as officers), Society for the Advancement of Chicanos and Native Americans in Science and Engineering, HBCU-Up Conferences, World Water Resources Conference, National Association of Engineering Student Councils, American Society of Agricultural and Biological Engineers, and Women of Color STEM Conference, and many other discipline specific state, regional, national, and even international conferences.

Internships: Phase III allowed scholars to participate in regional, national and international internships. Scholars conducted research with national laboratories such as Brookhaven National Laboratories, Sandia National Labs, and the Centers for Disease Control. Additional internship locations included, but are not limited to: all the major energy companies (i.e., Devon, Exxon, ConocoPhillips) NASA Space facilities, and universities (University of New York at Rochester, New Mexico State University, Avila University, and Harvard University).



Ryan Jordan on internship assignment in Africa

During Year 5, four scholars participated in international research. One scholar conducted research at the University of Wales, one in Slovenia, and one each in Turkey and Dominica.

Pursuing Higher Degrees (PHD) Camp: Forty-two scholars participated in a two-day, intensive camp on how to apply for and be accepted to graduate school. Sessions included topics such as the application process, writing personal goal statements, taking the



Pursuing Higher Degrees (PHD) Camp Participants

Graduate Record Exam (GRE), asking for letters of recommendation, and speed mentoring. The concept was used, with permission, from a similar program developed by the University of California-Berkeley. Professional speakers were brought in to speak with the scholars and for “hands-on” assistance. Scholars were provided a “graduate tool box” containing essential supplies and resources for the graduate school application process.

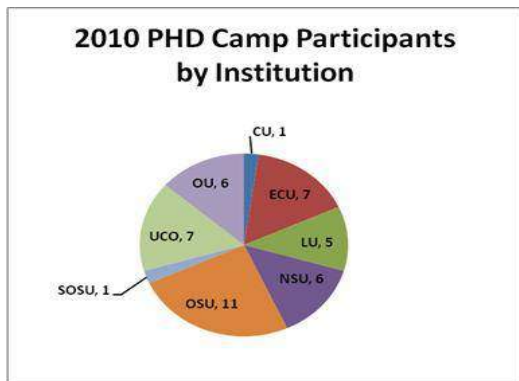


Figure 11. 2010 PHD Camp Participants by Institution and Classification.

## **PHASE IV: 2009--2014**

Phase IV of the program (2010-2014) was proposed to recruit increasing numbers of students into STEM fields using enhanced recruitment strategies: support students academically and professionally, rely on strong mentoring networks and links to research; prepare students for global success; and to strengthen an infrastructure that supports student success and professional development.

The Phase IV program noted several changes in the administrative staff. In 2010, Dr. Gordon Emslie, who wrote and submitted the proposal as the Principal Investigator, left Oklahoma State University. Dr. Mark Payton, Interim Dean of the Graduate College and Professor of Statistics, assumed the position of Principal Investigator/Program Director until he returned to a faculty position. In June 2012, Dr. Jean Van Delinder, Associate Dean of the Graduate College and Professor of Sociology, was appointed Principal Investigator/Program Director.



**Mark Payton**  
**PI: 2010-2012**



**Jean Van Delinder**  
**PI: 2012-Present**

In addition to changes of PI, Dr. Rosemary Hayes, long-time evaluator of the OK-LSAMP programs, left her position at the University of Oklahoma and the Center for Institutional Data Exchange and Analysis (C-IDEA). Sandra Whalen, who had worked with Dr. Hayes on the OK-LSAMP evaluations, became Interim Director for the C-IDEA and assumed responsibilities for evaluation of the OK-LSAMP programs. The partner institutions remained the same -- *Oklahoma State University* (OSU Lead Institution), *University of Oklahoma* (OU), *University of Tulsa* (TU), *Langston University* (LU), *Cameron University* (CU), *East Central University* (ECU), *University of Central Oklahoma* (UCO), *Northwestern Oklahoma State University* (NWOSU), *Northeastern State University* (NSU), *Southeastern Oklahoma State University* (SEOSU), and *Southwestern State University* (SWOSU). Phase IV administrative staff and campus coordinators are reported in Table 4.

Table 8. Phase IV Administrative Staff and Campus Coordinators

Person	Position
Jean Van Delinder, Ph.D.	Principal Investigator / Program Director
Mark Payton, Ph.D.	Principal Investigator / Program Director – Returned to faculty
Gordon Emslie, Ph.D.	Principal Investigator / Program Director—left university
Sandra Whalen, M.Ed.	Evaluator, Center for Institutional Data Exchange & Analysis
Rosemary Hayes, Ph.D.	Evaluator, C-IDEA – left university
Kay Porter, M.S.	Program Manager
Fara Williams, B.S.	Program Grant Coordinator
Carl Rutledge, Ph.D.	Co-Principal Investigator, ECU Campus Coordinator
Frank White, Ph.D.	CU Campus Coordinator
Sharon Lewis, Ph.D.	LU Campus Coordinator
Jody Buckholtz, Ph.D.	NSU Campus Coordinator
Timothy Maharry, Ph.D.	NWOSU Campus Coordinator
Camille DeYong, Ph.D.	OSU Campus Coordinator - returned to teaching full-time
Simin Pulat, Ph.D.	Co-Principal Investigator, OU Campus Coordinator
Brad Ludrick, Ph.D.	SEOSU Campus Coordinator
Tim Patton, Ph.D.	SEOSU Campus Coordinator – Retired from OK-LSAMP
Tim Hubin, Ph.D.	SWOSU, Campus Coordinator
J. C. Diaz, Ph.D.	Co-Principal Investigator, TU Campus Coordinator
Gregory Wilson, Ph.D.	UCO Campus Coordinator

### Alliance Highlights

During the first year of Phase IV, a campus coordinator retreat was held, along with community/junior college personnel, to discuss and form an articulation agreement with the community/junior colleges for the students transferring to OK-LSAMP alliance institutions. Students from the community/junior colleges, who are in STEM disciplines and have the minimum grade point average, will be eligible for OK-LSAMP benefits upon full-time enrollment at an Alliance institution. The retreat also brought together Campus Coordinators to share ideas and suggestions for recruitment and retention of scholars. The two-day retreat was the first one held during all phases of the LSAMP program in Oklahoma and was followed up by a visit from the Principal Investigator/Program Director to Alliance campuses to visit with presidents, mentors, and scholars.



Faculty and Student Teams (FaST) Grants: Four (4) FaST grants were awarded to Oklahoma faculty. These grants allowed faculty members to take students with them to national laboratories to conduct research during the summer months. Three grants were awarded to faculty at the lead institution, Oklahoma State University, and one was awarded to a team from Northeastern State University. Thirteen scholars were impacted. Two Native American teams conducted research at Brookhaven National Labs and two Native American teams conducted research at Argonne National Labs.

Graduate Research Fellowship Program (GRFP): In Year 1 of Phase IV, four scholars received GRFP awards from the National Science Foundation. The scholars



Andrew Mock & Lydia Meador

continued study in the following areas: (1) Zoology-Oklahoma State University (Tomica Blocker); (2) Microbiology-University of California-Berkeley (Brandon “Bubba” Brooks); (3) Chemical Engineering-Duke University (Erica Brown); and (4) Biology / Chemistry-University of North Carolina (Leethanial Brumfield, III). During Year 2, three additional GRFP awards were presented to scholars: Architectural Engineering-University of Illinois (Andrew Mock), and Biochemistry and Botany – University of Arizona (Lydia Meador), and Zoology – Oklahoma State University (Marissa Rice). In Year 4, two more scholars received GRFP awards. (1) Botany-Oklahoma State University (Josh McCloud), and (2) Ecology-Oklahoma State University (Jessica Sunny Evans).

Bridge to the Doctorate Fellowships: Oklahoma scholars were awarded BD Fellowships to continue graduate studies at the University of California-Santa Barbara, Howard University, Oklahoma State University, and the University of Oklahoma.

BD Cohort V: Oklahoma State University: Grant was awarded August 2010. Due to the late funding notification, BD Fellow applications were reviewed and accepted to begin in the Spring 2011 semester. This was, in part, due to most graduate program deadlines had passed and acceptance into graduate programs, for the fall semester, were not able to be met. Six Fellows began in the Spring 2011 semester, two Fellows began in the Summer 2011 semester, and the remaining four Fellows began Fall 2011. Five Native Americans, five African Americans, one Hispanic, and one First Generation Female were selected to participate in the BD Fellowship program.

Table 9. Cohort V BD Fellows

Cohort V Fellow	Discipline	Degree Progress
R. Paula Arscott	Chemistry	Ph.D. in Progress
Nicole Bryant	Botany	Ph.D. in Progress
Eric Butson	Chemistry	Ph.D. in Progress
Jamere King	Computer Engineering	Ph.D. in Progress
Darron Lamkin	Industrial Engineering	Completed MS; Ph.D. In Progress
Josh McCloud	Botany	Ph.D. in Progress
Molly Parkhurst	Botany	Ph.D. in Progress
Marissa Rice	Zoology	Transferred/another PhD program
Joseph Ross	Medical Physics	Ph.D. in Progress
David Supeck	Biochemistry	Ph.D. in Progress
Ana Tehrani	Statistics	Ph.D. in Progress
Charles Williams	Industrial Engineering	Ph.D. in Progress

BD Cohort VI: University of Oklahoma: Grant was awarded in October 2012. Fellow selection is underway. Successful applicants will begin the BD program Fall 2013.

National Scholarships: Scholars continued to be chosen as recipients of national scholarships. The scholarships included, but were not limited to: the Goldwater Scholarship, the UDALL Scholarship, and the Arthur Ashe Scholarship.

Outstanding Accomplishments: Cammi Valdez, a former scholar from Southwestern Oklahoma State University (SWOSU) and a current Ph.D. student at Harvard University was accepted as one of 77 to represent the United States at the 2010 Nobel Laureate Conference in Germany. Additionally, she was one of seven chosen to represent the United States at the EuroScience Open Forum in Torino, Italy.



Cammi Valdez -- 2010 Nobel Laureate Conference





**Brek Wilkins**

Research conducted by Dr. Brek Wilkins, post-doctoral associate in the Department of Biomedical Sciences at the OSU Center for Health Sciences, led to the creation of a *Health Smart Garment*. The *Health Smart Garment* technology will assist physicians in diagnosing cardiovascular and respiratory diseases. Biomedical scientists, industrial engineers, textile engineers and business professionals are creating a comfortable garment with sensors that monitor patient vital signs at home and allows early disease diagnosis. In addition, Brek has received a provisional patent for his research.

BD Fellow, Jonathan Gonzales, is currently completing Ph.D. requirements in Electrical and Computer Engineering. His research has led to an invention disclosure, which has turned into a provisional patent. In addition, Jonathan has had seven articles published in peer reviewed journals and been selected to present his research at numerous conferences.



**Jonathan Gonzales**



**Marissa Rice**

Oklahoma State University BD Fellow, Marissa Rice, a former LSAMP Scholar from Virginia Tech, captured the prestigious National Science Foundation Graduate Research Fellowship. Marissa is completing Ph.D. requirements in Zoology.

Internship Experiences: During years 1 and 2, the Alliance saw an increase of 50 percent in the number of scholars participating in the summer internship program. Scholars participated in internships including Research Experiences for Undergraduates (REU) at national and international locations. This increase in the number of scholars participating in the internship experience is reflected in the type of research they are conducting and the quality of mentoring received both during the academic year and during summer internships.

International Experiences: An increase of 275 percent was noted in international experiences for Oklahoma scholars. Scholars participated in research and study abroad activities in the following countries: Canada, France, Brazil, Egypt, Africa, Antarctica, Nicaragua, Honduras, Kenya, Philippines, Hungary, Dominica, Slovenia, Turkey, Spain, and Costa Rica. Internships with National Science Foundation support allowed scholars to participate in the Bucknell's 2011 International Research Experience for Undergraduates in Spain and the Native Americans and Pacific Islanders Research Experience (NAPIRE) in Costa Rica.

Conferences: Scholars throughout the alliance were able to present research at local, state, national, and international conferences. In addition to poster and oral presentations during the national conferences, several scholars have been elected to leadership positions. Examples include the National Society of Black Engineers (NSBE) regional parliamentarian and regional chair for leadership. As of May 2013, Phase IV Scholars have made 89 local, 443 state/regional, 117 national, and 11 international presentations for a total of 660 presentations.

Table 10. Scholar Presentations by Institution

Institution	Local	State/ Regional	National	Inter- national	Totals
Cameron University	2	9	3	0	14
East Central University	1	30		0	31
Langston University	1	101	26	0	128
Northeastern State University	6	30	2	2	40
Northwestern OSU	1	0	0	0	1
Oklahoma State University	35	119	49	3	206
Southeastern OSU	0	11	3	1	15
Southwestern OSU	6	32	12	1	51
University of Central Oklahoma	1	69	7	1	78
University of Oklahoma	34	20	10	2	66
University of Tulsa	2	22	5	1	30
Totals	89	443	117	11	660

Students: **Courtney Garcia**, Southwestern Oklahoma State University Chemistry senior, won the Outstanding Researcher Award at the Oklahoma EPSCoR 16<sup>th</sup> Annual Research Day at the Capitol for best presentation overall.



**Justina Bradley**, Biology major from Langston University, received a first place rating for research in her division.

### Follow-Up

The Oklahoma Alliance has been active for 19 years. During this time, the program has experienced changes and growth. The figures and tables below demonstrate the growth that has taken place during the previous years of the program.

The following chart reflects the change in the number of scholars during each Phase of the LSAMP program. Phases I and II concentrated more on freshman while Phases III and IV concentrate more on college junior and senior scholars.

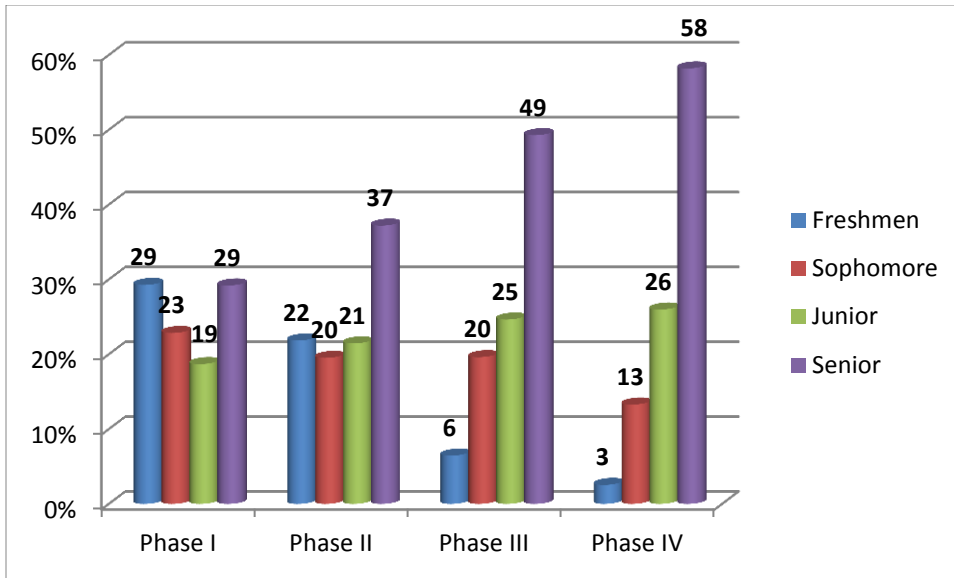


Figure 12. Percent of Scholars by Classification by Phase.

Graduation rates for OK-LSAMP Scholars have changed significantly during the 19 years of the program. Overall, the fluctuation of the numbers is attributed to the high dropout rate in Oklahoma. Oklahoma ranks 32<sup>nd</sup> in high school graduation rates nationally.

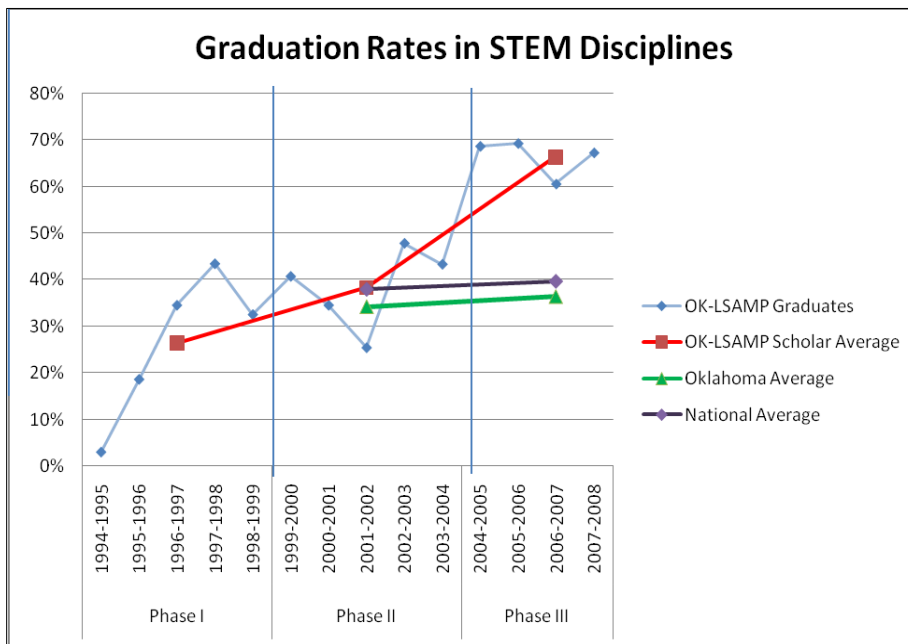


Figure 13. Comparison of Graduation Rates in STEM Disciplines in Phases I - III.

One of the major highlights of the Oklahoma LSAMP program is the Annual Research Symposium. The Symposium is traditionally held on the Oklahoma State University campus with all alliance schools in attendance. A guest speaker is invited along with poster and oral presentations by the scholars. Additional topics presented at the Symposium have included: *How to Apply to Graduate School, Preparing for and Taking the Graduate Record Exam, The Graduate Experience, Research Ethics, Summer Internship, and Q&A Panels.* A total of 729 oral and poster presentations have been made at the Symposium. Table 5 represents the historical review of participants during the past.



Dr. A. James Hicks, NSF, discusses research with Oklahoma Scholars

Table 11. Historical Review of OK-LSAMP Annual Research Symposium Participants

Year	Oral Presentations	Poster Presentations
1995	0	16
1996	0	22
1997	1	31
1998	3	30
1999	4	25
2000	7	19
2001	7	16
2002	17	20
2003	18	39
2004	15	25
2005	17	34
2006	18	18
2007	19	19
2008	14	32
2009	20	40
2010	18	53
2011	15	41
2012	16	40
<b>TOTALS</b>	<b>209</b>	<b>520</b>

The number of Alliance scholars is represented by the chart below. It should be noted that during Phase I and Phase II, summer bridge programs were the reason for the large number of scholars. At the beginning of Phase III, the shift to recruiting junior and senior students and preparing them for graduate school showed a definite drop in numbers. Two years into Phase IV, the number of scholars already exceeded the projected goal of scholars for the five years of the grant.

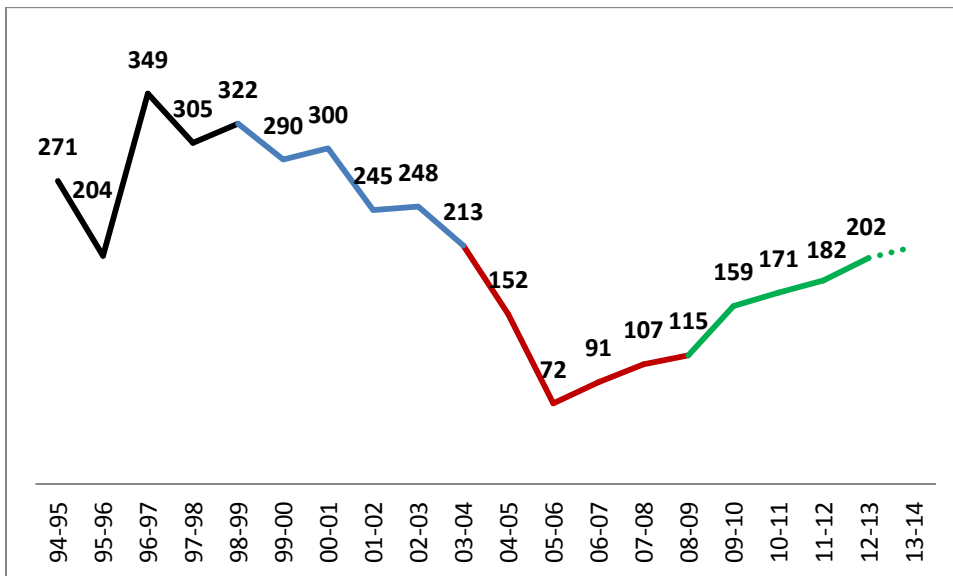


Figure 14. Number of Scholars from Phase I to Phase IV with Projected Five Percent Increase for Year 5.

The distribution of scholars by ethnicity/race during the course of the project (Phase I-IV) shows OK-LSAMP continues to recruit and retain a large percentage of Native American students in the STEM disciplines. OK-LSAMP works closely with the four Native American tribal colleges in recruiting students into programs. Campus coordinators are also connected with students, faculty, and industry leaders who are a part of the Oklahoma Native Americans in Higher Education (ONASHE) organization. ONASHE provides opportunities for Native American students and professionals from various institutions across the state of Oklahoma to continue to develop and strengthen their leadership skills by interacting with current tribal leaders, participate in workshops that are relevant to contemporary student and leadership issues, and create powerful networks promoting higher education for Native students.

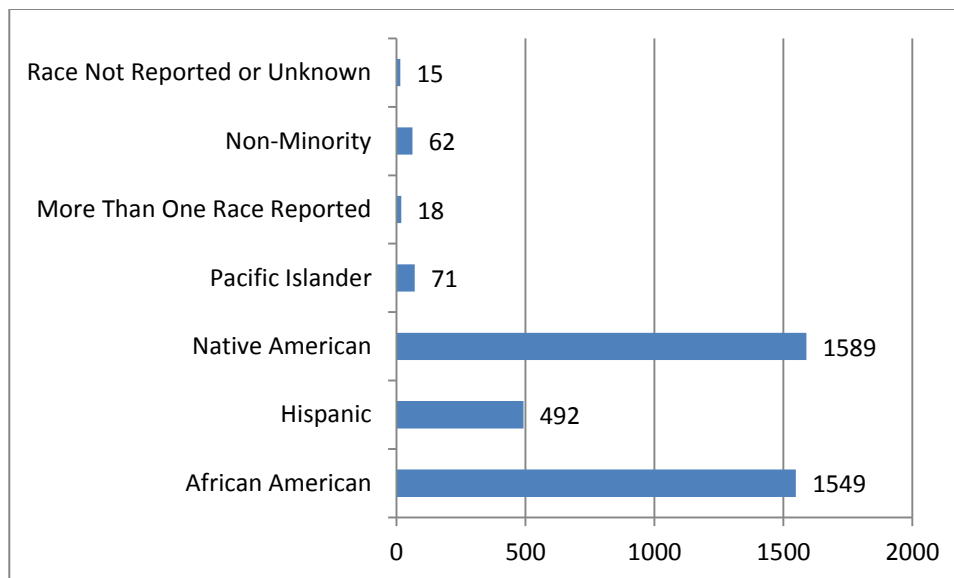
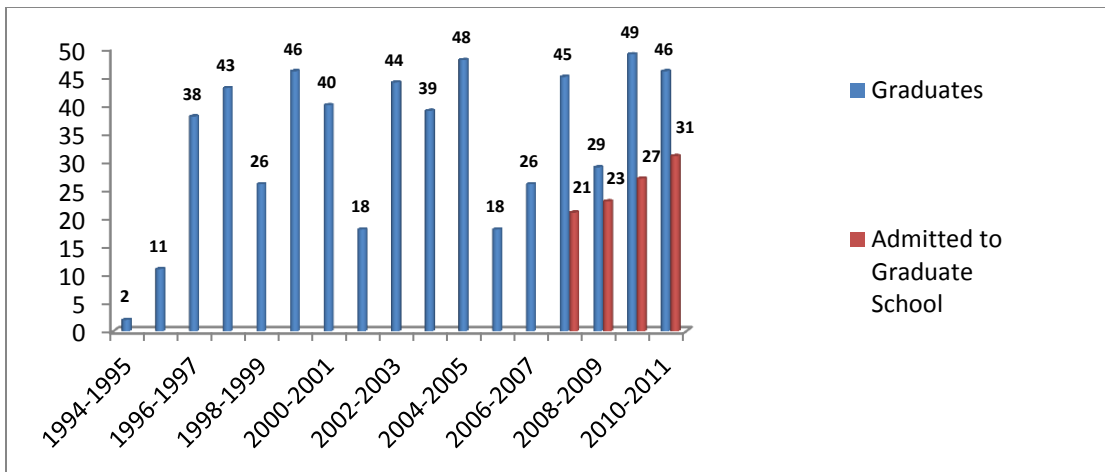


Figure 15. Scholars by Ethnicity/Race for Phases I - IV.

OK-LSAMP continues to provide students from all under-represented populations with the support and guidance needed to successfully graduate in STEM disciplines. Data on the number of OK-LSAMP graduates attending graduate school prior to Phase III are not available. The information in Figure 15 shows the number of OK-LSAMP graduates by year and the number admitted to graduate programs for the past four years. There has been a steady increase in the number of scholars being retained until graduation and the number being admitted to graduate programs. Additionally, it should be noted that eight scholars have received funding from the Graduate Research Fellowship Program, others were accepted into Bridge to the Doctorate programs across the nation, and still more scholars received other fellowships and scholarships for graduate school support.



\*Data not available prior to 2007-2008

Figure 16. Number of Graduates and Number Admitted to Graduate Programs.

### Economic Impact Statement

Oklahoma educators recognize that higher education is critical to the economic growth in the state, not only in the number of degrees earned and the number who stay in the state, but to compete globally as well. Higher education indirectly and directly accounts for approximately 23 percent of the state’s economy. The Oklahoma State Regents for Higher Education (OSRHE, 2011) indicated that for every \$1 of state-appropriated funds spent on higher education in Oklahoma, an additional \$5.15 is pumped into the state’s economy. The majority of students (82 percent) earning a bachelor’s degree were employed in Oklahoma one year after graduation. Five years after graduation, 62 percent were employed in Oklahoma, while fewer master’s, professional, and doctoral graduates remained (OSRHE, 2008). Five years after graduation, bachelor’s degree recipients employed in Oklahoma were earning \$40,079 on average followed by master’s degree recipients (\$50,871), and doctoral degree recipients (\$60,780). Among bachelor degree recipients engineering and computer science graduates were paid the top salaries, averaging, \$51,584 annually.

Although the vast majority of graduates of Oklahoma public higher education institutions remain in Oklahoma, the “out” migration is evident in technical fields of study such as engineering, computer science, and physical sciences. Progress is being made, however, and results for 2001-02 bachelor’s degree holders in mathematics, biological sciences, computer science, engineering, and architecture show higher percentages remain in-state after five years than was true for graduates of previous studies. Creating opportunities for students to enroll in Oklahoma higher education is one step toward producing more graduates and increasing the state’s intellectual capital. It is equally important that students who enter college actually continue to the point of graduation.



In the Fall 2012, Oklahoma institutions of higher education reported an overall enrollment of 193,462 students in all degree programs. The 11 institutions in the OK-LSAMP alliance reported minority and under-represented students accounted for 10 percent of the overall enrollment. Science, technology, engineering, and mathematics (STEM) enrollments for under-represented students at alliance institutions totaled 5,578 students. The breakdown by ethnicity/race is: Black/African American (1359), Hispanic (1194), Native American (1903), Pacific Islander (24), and More than one race (1098).

The OK-LSAMP program began in 1994-1995 with overall minority enrollments in STEM totaling 1325. In 2011-2012, the overall minority enrollment in STEM was 5578, a **321 percent increase** in minority STEM enrollments at Oklahoma alliance institutions. Hayes (2011) stated in her evaluation report “***Students that enter this program, almost without exception, graduate within STEM and 50% or more go on to graduate school.***”

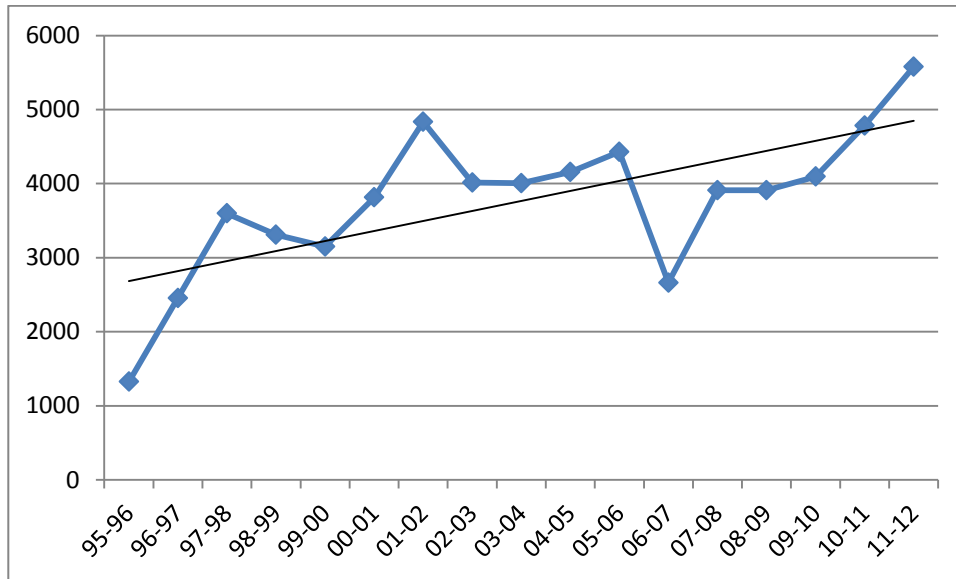


Figure 17. URM STEM Enrollment, Alliance Institutions, 1995-2012.

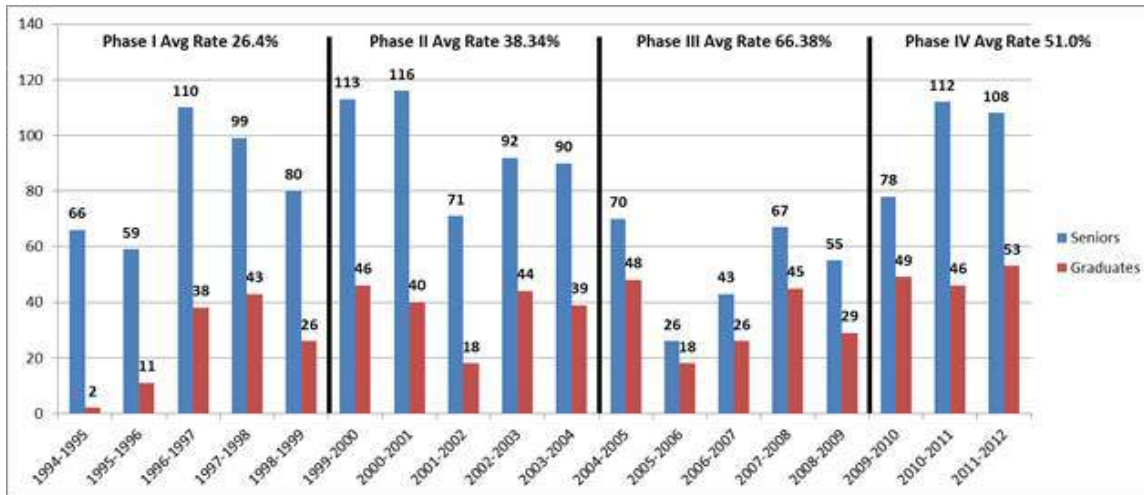


Figure 18. Percent of Senior Scholars Completing Degree Requirements.

The number of minority and under-represented students receiving Bachelor of Science degrees in STEM has shown changes in the last 19 years. During the initial period of OK-LSAMP, 319 URM STEM degrees were awarded at OK-LSAMP institutions. In 2012, 658 URM STEM degrees were awarded. Overall, 9,144 Bachelor of Science URM STEM degrees have been awarded to students attending Oklahoma alliance institutions. This consistent increase in the number of graduates in STEM degree programs is indicative of meeting program goals and objectives and influencing the culture of Oklahoma and under-represented populations.

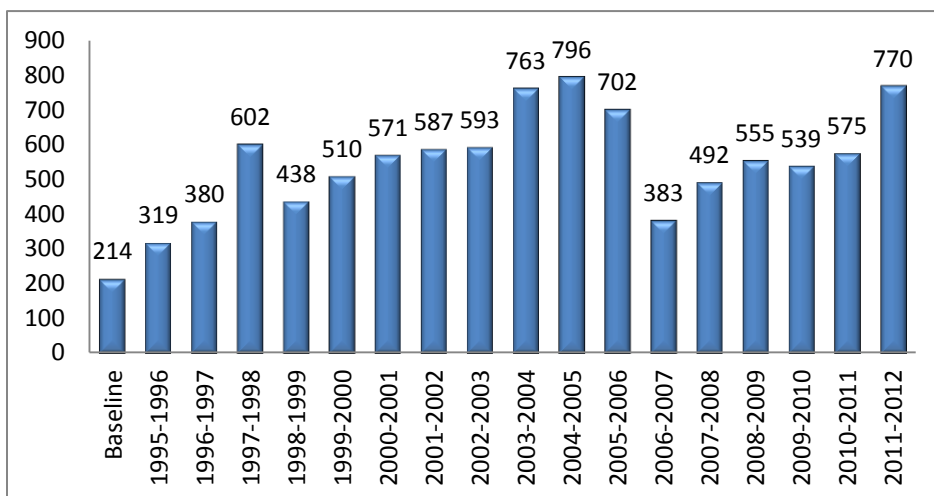


Figure 19. URM STEM Degrees Awarded in Oklahoma.

## Community College and Tribal College Relations

The Oklahoma Alliance connects with numerous community and tribal colleges throughout the state. In addition, Alliance schools connect with other programs such as ones located at higher education centers, on military bases, national laboratories, and community colleges in the State of Texas. The Oklahoma State Regents for Higher Education (OSRHE) articulation agreement and policy “guarantees transferring students successfully completing Associate of Science or Associate in Arts degrees into higher education institutions in the Alliance.” According to a report by the OSRHE (2003), “the benefits of a robust economy are many: jobs for the young, increased business revenues, greater availability of public investment funds, and eased tax burdens. The activities of the Oklahoma Community College Districts benefit state businesses directly by raising the skill level of the state labor force and providing opportunities for direct contract training of employees. State businesses benefit as well because the presence of a trained labor force works to attract new industry and increase the efficiency, competitiveness and output of existing industry. All these together spell a more effective and robust state economy.”

Alliance campus coordinators work with faculty and staff from the colleges to identify minority and under-represented STEM majors who are transferring to Alliance four-year institutions. Overall, the statewide economy is affected by students in the community / tribal colleges from the day-to-day operations and from students who enter the workforce with increased skills and through continued enrollment at four-year institutions.

Table 12 outlines the connections between Alliance institutions and community / tribal colleges, as well as other programs such as those located on military bases and/or national laboratories.

Table 12. Alliance / Community and Tribal College Connections

Alliance Institution	Community / Tribal College
Cameron University	Redlands Community College Western Oklahoma State College Comanche Nation College Fort Sill AFB Amarillo Community College, Texas Vernon Junior College, Texas
East Central University	Eastern Oklahoma State College Murray State College Oklahoma City Community College OU Center for Health Sciences – Early Entry Redlands Community College Rose State College Seminole Community College Chickasaw Nation
Langston University	Rose State College Tulsa Community College
Northeastern State University	Connors State College NSU – Broken Arrow campus Tulsa Community College Bacone College
Northwestern Oklahoma State University	Northern Oklahoma College Enid Campus Stillwater Campus Tonkawa Campus Selmon Living Lab
Oklahoma State University	Northern Oklahoma College Tulsa Community College College of the Muscogee Nation Cheyenne-Arapaho Tribal College Comanche Nation College Pawnee Nation College
Southeastern Oklahoma State University	Eastern Oklahoma State College Murray State College Higher Education Center Native American Intertribal Grant
Southwestern Oklahoma State University	Redlands Community College SWOSU – Sayre Campus Western Oklahoma State College Cheyenne-Arapaho Tribal College
University of Central Oklahoma	Northern Oklahoma College Oklahoma City Community College Redlands Community College
University of Oklahoma	Oklahoma City Community College Rose State College
University of Tulsa	Tulsa Community College

The OK-LSAMP Alliance has worked closely with community colleges for the past 19 years. Specific examples include, but are not limited to: (1) Oklahoma State University collaborates with Northern Oklahoma College (NOC) in the NOC-OSU Gateway Program. The program is located on NOC's Stillwater campus. Students who have applied for freshman admission to OSU, but do not meet current admission requirements may qualify for admission to the NOC-OSU Gateway Program. Gateway courses transfer as equivalent to specific OSU courses and meet general education requirements. Students in the NOC-OSU Gateway Program are eligible to be OK-LSAMP Scholars and be paired with a faculty mentor. (2) OSU also has two branch campuses that offer Associate's degrees. Students in STEM degree programs are encouraged to continue at OSU and to become Scholars. (3) The "dual enrollment" program between Tulsa Community College (TCC) and OSU continues to be successful. Students applying for the dual admission program are accepted at both TCC and OSU. Once admitted, a 4-year plan is developed. Students will complete courses at TCC before attending OSU, thus allowing students to graduate from Oklahoma State University. (4) East Central University (ECU) works closely with Seminole State College. (5) Southwestern Oklahoma State University connects with Sayre Community College to recruit students in the STEM disciplines and encourage enrollment in programs in the respective schools. (6) Tribal colleges (Bacone College, Pawnee Nation College, College of the Muscogee Nation, Cheyenne-Arapaho Tribal College and the Comanche Nation College) each have articulation agreements with Alliance schools to support the transfer of students to four-year institutions.

### Bridge to the Doctorate Program

Oklahoma has supported six cohorts for the Bridge to the Doctorate (BD) program. Former LSAMP scholars have been admitted to graduate programs at the University of Oklahoma and Oklahoma State University. To date seven Fellows have completed Ph.D. requirements. Fellows completing Ph.D. requirements are currently employed as Professional Engineers, conducting post-doctoral research, and teaching at universities. The 30 Fellows who have completed MS degree requirements consist of 23 returning to the workforce following graduation. Seven Fellows continue in Ph.D. programs with anticipated Ph.D. degrees to be awarded within the next 12 months. The remaining Fellows are making satisfactory progress toward completing Ph.D. requirements.

### International Experiences

Over the course of the past 19 years, the LSAMP program in Oklahoma has experienced changes that reflect the dynamic nature of the world in which we live. More and more scholars are seeking international experiences for summer internships and study abroad opportunities. International activities help to prepare scholars for future careers

by adding experiences that can help build relations with foreign clients and add diverse perspectives and experiences to the research skills they acquire during their academic career. The international experience also demonstrates a global awareness and understanding and the ability to face new challenges, and adapt to new environments. International experiences help to set scholars who are seeking employment and/or graduate programs apart from other applicants.

Oklahoma scholars have had experiences in the following countries:

Antarctica	Australia	Azerbaijan	Bolivia	Brazil
Canada	Costa Rica	Dominica	Egypt	Ethiopia
France	Germany	Honduras	Hungary	Italy
Kenya	Mexico	South Korea	Nicaragua	Philippines
Scotland	Slovenia	Spain	Sri Lanka	Sweden
Thailand	Turkey	Wales	Zambia	



Figure 20. OK-LSAMP 2012 Joint Annual Meeting (JAM) Poster on which International Experience Locations were Highlighted.

## Conclusions

In a state that is often remembered for barren landscape of the “Dust Bowl,” there is clear evidence of growth and change that is opening up opportunities for under-represented minority students. Just as many of the settlers of Oklahoma saw the opportunity to homestead as a chance to develop a better future, increasingly URM students in Oklahoma, supported by the Alliance institutions, are seeing the opportunities in STEM fields. This opportunity for success is not without hard work. The partners in the Alliance have seen time and again that when standards for excellence are defined and supportive structures are put into place, URM students rise to meet the challenge. Students within the Oklahoma Alliance, almost without exception, graduate within STEM fields. Over 50% of the students in the Oklahoma LSAMP Alliance continue to graduate school.

But, even for the students that do not go to graduate school, the completion of a college degree is a major accomplishment. According to the most recent study on the retention and graduation rates of first-time, full-time freshman cohorts conducted by the Consortium for Student Retention Data Exchange at the University of Oklahoma, the ten year graduation rate for Blacks, Hispanics, and Native Americans are 50.3%, 56.3% and 45.6% respectively.

A 2013 report, *Oklahoma Public Higher Education: Economic and Social Impacts*, reported “having a skilled and well-educated workforce is critical to our state’s economic success. . . expenditures of the Oklahoma public higher education system generate \$9.2 billion in economic output impacts in the state and support more than 85,000 Oklahoma jobs. In addition, the researchers were quoted, “Oklahoma’s public research universities have particularly notable performance in a range of academic research fields that are highly relevant to the state economy, including: agricultural and environmental sciences, energy-related research disciplines, manufacturing related research disciplines, clinical medicine, and broader physical and biological sciences. Universities have been particularly successful in leveraging federal funds and gaining industry-sponsored research funding, which rose of 49.8 percent over the recent year-year period, far outpacing the national growth of 25.8 percent.”

Alliance graduates in Oklahoma continue to have an impact on the state’s economic development, with approximately 90 percent of the graduates continuing to live and work in Oklahoma.

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