



UNIVERSITY OF  
ARKANSAS.

## Department of Geosciences

Fulbright College of Arts and Sciences

### Degree Programs

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ERSCBS Bachelor of Science in Earth Science

GEOGBA Bachelor of Arts in Geography

*BS Geography with Cartography/Geospatial Concentration*

*Minor in Geography*

*Minor in Historic Preservation*

GEOLBS Bachelor of Science in Geology

*BS Geology with Geophysics Concentration*

*Minor in Geology*

GISTCP Undergraduate Certificate in Geospatial Technologies

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GEOGMS Master's of Science Geography

GEOLMS Master's of Science Geology

GISTGC Graduate Certificate in Geospatial Technologies

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GEOSPH Doctor of Philosophy in Geosciences

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## Executive Summary

In the seven years since last reporting, the Department of Geosciences has experienced significant change and is well-positioned for success going forward.

### Major accomplishments:

1. Geosciences has replaced 12 of 22 faculty -- 6 geography and 6 geology (Section I.A)
2. Research funding is currently second in Fulbright College of 19 departments. (IX.G)
3. The PhD program (initiated in 2012) has grown from 2 candidates in the fall of 2013 to a total 20 candidates today supported by 7 central TA lines, 2 foundation TA lines, and 14 students on research funding representing a \$280K annual benefit to UA. (X)
4. External Advisory Board and alumni have continued generous support and the department now has \$3.2M in endowed foundation accounts that fund two PhD TA lines and various scholarships across all degree programs. (I.A)
5. Curriculum has been continuously reviewed and updated (V.B):
  - a. Geology BS has been substantially revised
  - b. Geography and Geology MS degree requirements have been simplified and streamlined
  - c. Geosciences PhD admission and graduation requirements have been simplified to allow expression of the wider range of geoscience research areas in the department
6. New or revised policy documents for Personnel (Appendix F), Diversity & Inclusion (Appendix E), field safety and harassment plan.

### Areas of concern:

1. Total enrollment is 200 students across all levels and degree programs, down from a peak of 265 in 2016. Improved recruiting efforts will be needed going forward. (IX.A)
2. The PhD program is limited by only 7 central TA lines in support of 22 faculty. An increase of 4 central TA lines would help new faculty be research-active and free up foundation funds for other student support. (X)
3. Graduate student stipends are not competitive with peer institutions (X). Graduate school fellowships (DDF/DAF) compensate for top PhD students and departmental scholarships help others, except funds are insufficient due to the cost of two foundation-funded PhD TA lines.
4. The Earth Science BS degree program needs to be revised to add a capstone course and align with career opportunities. (X)
5. The Geography BS program needs a capstone course and defined concentration areas such as GIScience. (X)

## I. Introduction and brief history of the program

The Department of Geosciences in the Fulbright College of Arts and Sciences at the University of Arkansas--Fayetteville offers the following programs: BA and MS in Geography; BS and MS in Geology; BS in Earth Sciences, and PhD in Geosciences. The Department also is part of two interdisciplinary doctoral programs: 1) Environmental Dynamics (ENDY) and 2) Space and Planetary Sciences (SPAC). Members of the Geosciences faculty have served as the Director of the Center for Advanced Spatial Technologies (CAST), Director of the Environmental Dynamics Program, Associate Director of the Center for Space and Planetary Sciences, Director of European Studies, Co-Director of the Sustainability Academic Programs, and Associate Director of the King Fahd Center for Middle East Studies. The Department of Geosciences was formed in 1999 by the merger of the two separate departments of Geography and Geology.

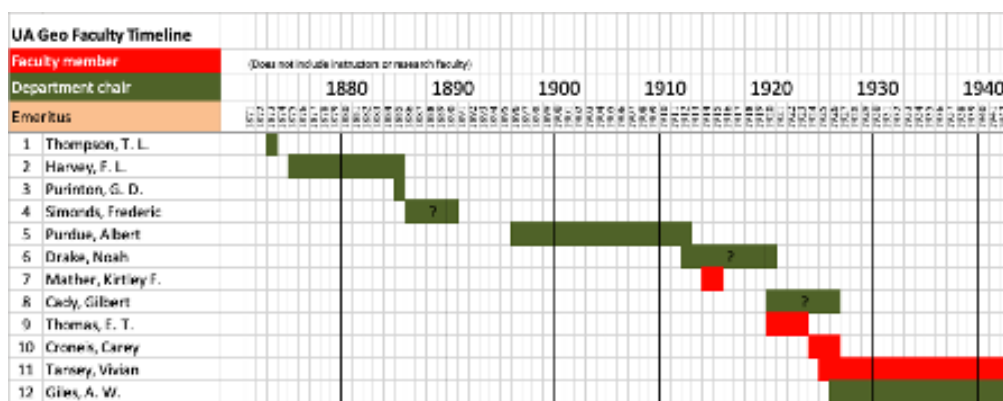
The Department of Geosciences occupies a portion of Gearhart Hall along with the Honors College and the Graduate School. Gearhart Hall (formerly Ozark Hall) was recently renovated and remains on the National Historic Register. The renovation has provided much needed upgrades and additional space for an expanding Department of Geosciences, but still does not provide all the space necessary to meet the research needs. Lecture courses, graduate seminars, and teaching laboratories share twelve dedicated classrooms (Rms. 006, 008, 012, 013, 017, 038, 105, 109, 110, 111, 145 and 149). Two computer laboratories are available for students (101 and 113). GEAR 101 seats 30 is primarily for teaching with research access in the off times, while GEAR 113 seats 20 and is dedicated to graduate research. The geophysics program has a dedicated computer space (GEAR 109) to support the high-end geophysical software. Other courses that require significant computer-based teaching use classrooms that are part of the Center for Advanced Spatial Technologies (CAST), housed in JB Hunt Hall. Three wet geochemistry laboratories in Gearhart Hall for teaching and research are shared by several faculty, at least two faculty per laboratory. Five classrooms in Gearhart Hall including the large 217 seat lecture hall are scheduled via R25 (centralized room scheduling) and may only be allocated to Geosciences in a given semester if class sizes warrant. There is one large conference room which is a scheduled facility for all building occupants. The remaining space in Gearhart Hall is allocated for faculty and graduate student offices. Other facilities include a class 10,000 clean research laboratory maintained by individual faculty in Ferritor Hall, and space at the corner of Razorback Road and Martin Luther (building MLKB) houses a tree ring and rock sample prep areas, as well as sediment experiment area. A list of departmental laboratories and research equipment is included in section VII.A.

## **A. Historical Overview**

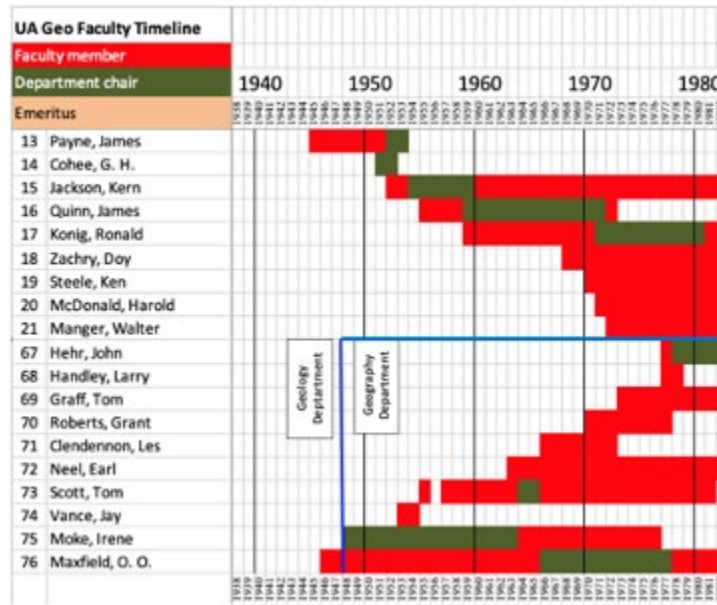
The Department of Geosciences has a long history that begins with the Department of Chemistry and Natural Science not long after founding the University of Arkansas in 1871. As early as

1873 professor T. L. Thompson offered classes in mineralogy, followed by F. L. Harvey from 1875-1885. The Department of Geology was separated from biology in 1896 and Albert Purdue was brought from the University of Chicago to chair the new Geology Department. It is noteworthy that J. C. Branner, the first Arkansas State Geologist and close associate of the department, joined the newly created Stanford University in 1893, becoming vice president in 1899 and president in 1913.

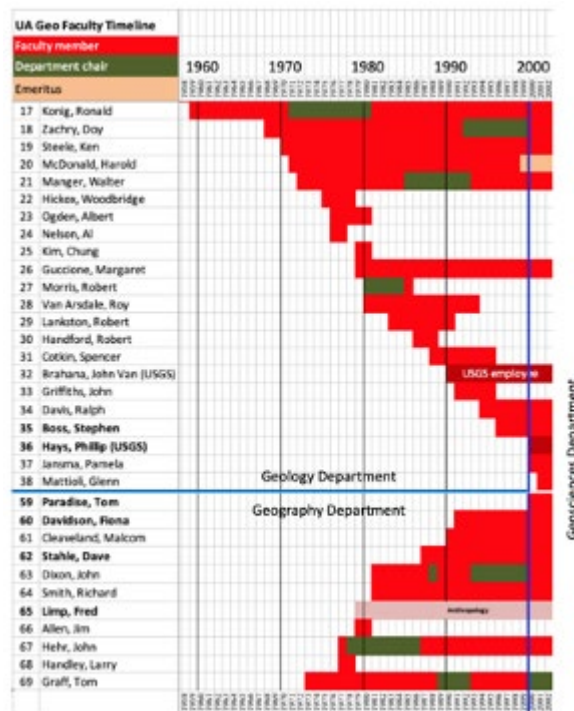
The timeline below shows early geology faculty up to 1940. This period includes Frederic Simonds, who was the first trained geologist and only the second PhD to serve the university. In 1890, Simonds accepted the chair of geology at the University of Texas at Austin where he is credited as being instrumental in the building of that institution.



The late 1940s saw a period of growth in the department, perhaps driven by students returning on the GI bill after World War II and the Korean War. In 1946 O. O. Maxwell left the department to found the Geography department. Through the early 1980s both geology and geography departments grew to a maximum of 6 faculty each.



The mid-1980s and early 1990s presented difficult conditions for the geology department with a series of petroleum industry downturns. This weakness ultimately caused the dean of Fulbright College to form a merger of the departments of Geology and Geography to form Geosciences in 2000. This transition had its difficulties, but as time has progressed the alliance seemed prophetic. Cartography and GIS are now core disciplines of geology, human geography, climate and, of course, GIScience.

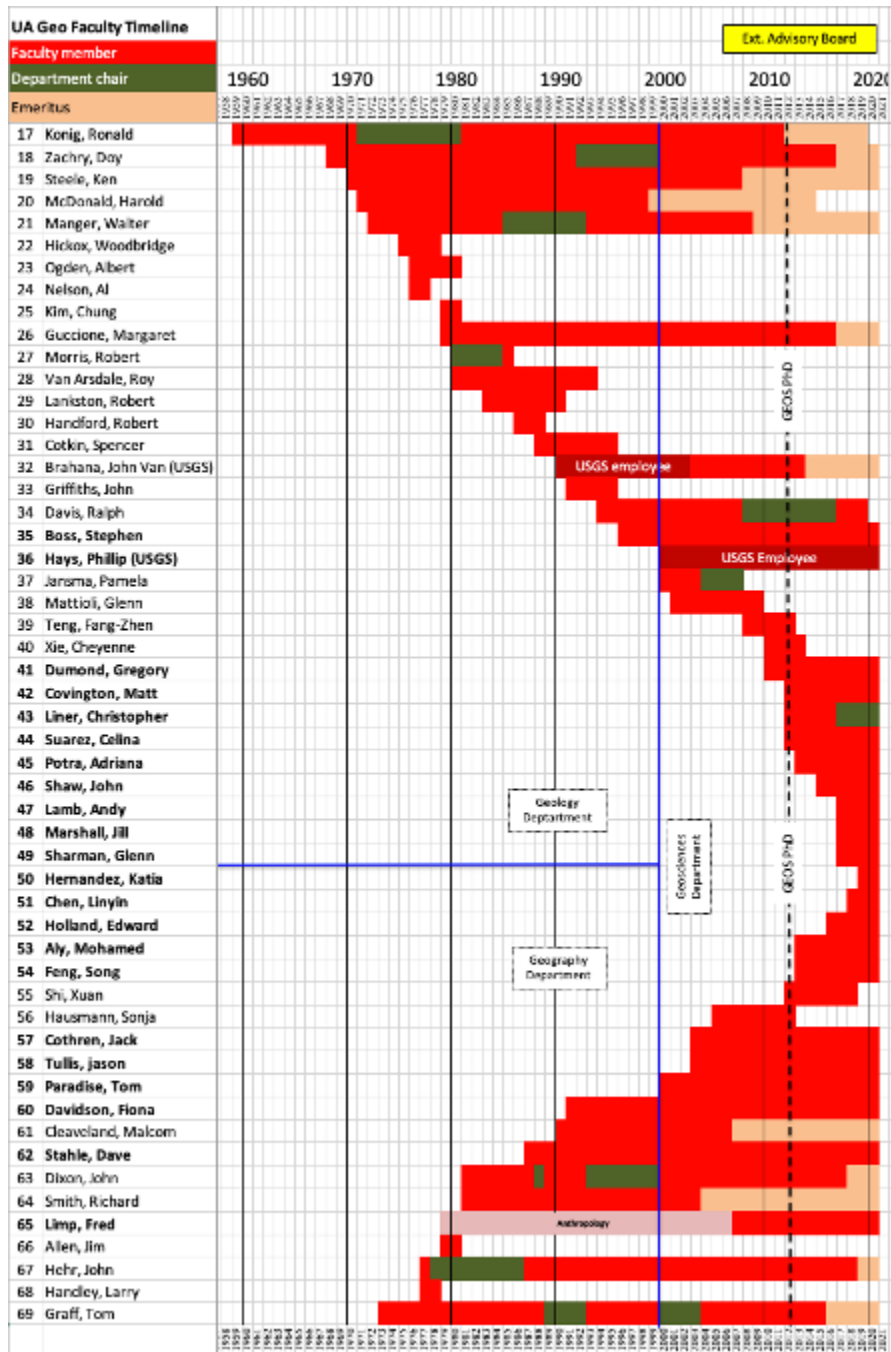


In the years following the merger, some geology alumni began to be concerned about alignment of the department with employment opportunities. In 2006, an external advisory board was established and quickly became a driving force for change in the department and visibility with college and central administration. While the advisory began with geology alumni, the board has worked tirelessly to include geography alumni as well. Current members of the department external advisory board can be found in Appendix E.

The board was instrumental in promoting and gaining central approval for the Geosciences PhD program in 2012, establishment of the Maurice F. Storm Endowed Chair of Petroleum Geology the same year, and development of the GeoVision foundation account for unrestricted student support. The board continues to be a powerful advocate and advisor to the department.

Current tenure track and emeritus faculty are shown on the timeline below.

U Arkansas Department of Geosciences Self-Study Report 2020



The Geosciences Department is loosely divided into the areas of geography (human, climate, physical, GIScience) and geology (several areas). There are currently two endowed professorships in the department: the Leica Chair (Limp) and the Storm Chair (Liner), two University Professors (Limp, Paradise), and two Distinguished Professors (Stahle, Sui).

Organization chart for current tenure-track faculty and staff is shown below. New faculty since fall 2013 are Aly, Befus, Cheng, Feng, Fernandes, Holland, Huang, Lamb, Marshall, Potra, Sharman and Shaw.

Geosciences Department				
Tenured and Tenure Track				Chairman: Christopher Liner
				Vice Chairman: Fiona Davidson
Geology		Geography		Staff
Stephen Boss	Celina Suarez	Jack Cothren <small>Director of CAST &amp; ANPCC</small>	Fiona Davidson	Jackie Shearman
Christopher Liner <small>Endowed Stern Chair</small>	Andy Lamb	Fred Limp <small>Endowed Stern Chair</small>	Song Feng	JoAnn Kvamme <small>20%</small>
Matt Covington	Jill Marshall	Tom Paradise	Mohamed Aly <small>aka Geology</small>	Jessica Eckberg
Gregory Dumond	Glenn Sharman	David Stahle	Yinlin Cheng	Ashley Chua <small>50%</small>
Adriana Potra	Kevin Befus <small>Fall 2020</small>	Dan Sui <small>Vice Chancellor of Res. &amp; Innov.</small>	Katia Fernandes	
John Shaw		Jason Tullis	Ted Holland	
			Xiao Huang <small>Fall 2020</small>	

- Professor
- Associate Professor
- Assistant Professor
- Incoming faculty
- Open position

In addition to regular faculty, the department has a significant corps of others who contribute to the teaching mission, advising students, and research. Many of these bring experience from national laboratories, industry and other universities to the benefit of our students. The organization chart below shows non-tenure-track faculty, instructors, emeritus and adjuncts.

Geosciences Department						
Other Faculty and Support				Chairman: Christopher Liner	Vice Chairman: Fiona Davidson	
Geology			Geography			
Dr. Phillip Hays <small>USGS</small>	Kenneth Steele	Robert Liner <small>Stephen Professor Company</small>	Dr. Jason Patton <small>Western Technology University</small>	Seth Warn	Rashauna Hintz	
Dr. Barry Shaulis <small>USGS</small>	Doy Zachry	Dr. 'Mac' McGilvery <small>Consulting (retired)</small>	Ray Quick	Malcolm Cleavland	Don Bragg <small>US Memphis</small>	
Eric Pollock <small>USGS Manager</small>	Dr. Henry Turner	Doug Melton <small>Retired 2019</small>	Dr. Laura Ruhl <small>USGS</small>	John Dixon	Dr. Dorian Burnette <small>U of Memphis</small>	
J. Van Brahana	Paula Anderson	Steve Milligan <small>Leica</small>	Phillip Shelby <small>Retired 2019</small>	Thomas Graff	Robert Oglesby <small>U. Tennessee</small>	
M J Guccione	Dr. William Green <small>USGS</small>	Christopher Moyer <small>Former KANSAS</small>	Jamie Woolsey <small>PG Geoscientist</small>	John Hehr		
Walter Manger	Dr. Peng Li <small>Arkansas Geological Survey</small>	Dr. Fred Paillet <small>USGS (retired)</small>	Dr. Andrew Wulff <small>U. West. Kentucky</small>	Richard Smith		

- Research Faculty
- Emeritus Faculty
- Instructor
- Adjunct Faculty

## Graduate support

The department has support for 27 TA lines

- 12 geology MS (central funding)
- 6 geography MS (central funding)
- 9 geoscience PhD (7 central funding, 2 GEOS foundation funding)

Teaching Assistantships -- Geography	Salary		Awards/Grants/DAF-DDF	Funding
Afroz, Mahmud	\$12,600.00	Academic Year		Hard funded
Bridges, Maggie	\$12,600.00	Academic Year		Hard funded
Saim, Abdullah	\$12,600.00	Academic Year		Hard funded
Swick, Racine	\$12,600.00	Academic Year		Hard funded
Rowell-Buff, Amy	\$12,600.00	Academic Year		Hard funded
Francis, Tia	\$12,600.00	Academic Year		Hard funded
<b>University total</b>	<b>\$75,600.00</b>			
<b>Teaching Assistantships -- Geology</b>				
Amaral, Chelsea	\$12,600.00	Academic Year		Hard funded
Jimerson, Cole	\$12,600.00	Academic Year		Hard funded
Sampong, Asher	\$12,500.00	Academic Year		Hard funded
Morris, Amy	\$12,600.00	Academic Year		Hard funded
Johnson, Isaac	\$12,600.00	Academic Year		Hard funded
Johnson, Linnea	\$12,600.00	Academic Year		Hard funded
Oefinger, Jordan	\$12,600.00	Academic Year		Hard funded
Chun, Byong Suk	\$12,600.00	Academic Year		Hard funded
Patterson, Ruby	\$12,600.00	Academic Year		Hard funded
Jenkins-Joyce, Keaton	\$12,600.00	Academic Year		Hard funded
McCabe, Douglas "Cooper"	\$12,600.00	Academic Year		Hard funded
Ball, Charles "Adam"	\$12,600.00	Academic Year		Hard funded
<b>University total</b>	<b>\$151,200.00</b>			
<b>Masters Research Assistantships - GEOS</b>				
Pidgeon, Elizabeth	\$20,000.00	Academic Year		Grant funded
Mmasa, Dennis	\$15,000.00	Academic Year		Grant funded
Gates, David	\$14,600.00	Academic Year		Grant funded
Zapp, Sam	\$12,200.00	Academic Year		Grant funded
<b>Research total</b>	<b>\$61,800.00</b>			
<b>PhD Assistantships -- Geosciences</b>				
Ahmed, Moamen	\$14,500.00	Academic Year		Hard funded
Howe, Cassandra	\$14,500.00	Academic Year	DDF - 4yrs	Global Campus
Linck, Rachel	\$14,500.00	12 Month	DAF - 4yrs	Endowment
Menlo, Emma	\$14,500.00	12 Month	DAF - 4yrs	Hard funded
Morris, Noah	\$14,500.00	Academic Year		Hard funded
Oberg, Danielle	\$14,500.00	Academic Year		Grant funded
Corbin, Tanner	\$14,500.00	12 Month		Grant Funded
Ali, Jahangir	\$14,500.00	Academic Year		
Whaley, Timmera	\$14,500.00	Academic Year		Hard funded
<b>University total</b>	<b>\$130,500.00</b>			
<b>Research</b>				
Abbas, Olanrewaju	\$14,500.00	Academic Year	C. Limer Storm Acct.	Endowed Fund
Strickland, Ryan	\$14,500.00	Academic Year	N. Covington DDF	Hard funded
Cathcart, Chris	\$20,600.00	12 Month	J.Shaw DAF	Grant Funded
Wyatt, Katherine	\$14,500.00	9 Month	J. Coltrien	Global Campus
Trunz, Celia	\$20,000.00	Geology-12mo	N. Covington	Grant Funded
<b>Research total</b>	<b>\$84,100.00</b>			
<b>Research total</b>	<b>\$145,900.00</b>			
<b>University total</b>	<b>\$357,300.00</b>			
<b>Total</b>	<b>\$503,200.00</b>			

Departmental scholarships are made possible by our generous donors. Total funds under management for the department exceeds \$3M and we have nine alumni who are members of the prestigious Towers of Old Main giving group recognizing at least \$100K in gifts:



Marshall Hughes, Plano, TX  
Larry Martin, Tulsa, OK  
Shane Matson, Tulsa, OK  
Mac McGilvery, Fayetteville, AR  
Maurice Storm, Tulsa, OK  
Eddie Valek, San Antonio, TX  
Alex Warmath, Houston, TX  
John Williams, Houston, TX  
William Willis, Hot Springs, AR

The department is also well-represented on university and college funding committees, including

- Campaign Arkansas At-Large Committee
  - Maurice Storm
- Campaign Arkansas Fulbright Committee
  - Jeff Hall
  - Shane Matson
  - Eddie Valek
  - John Williams

### **Departmental Scholarship Information**

#### **J. VAN BRAHANA SCHOLARSHIP**

Established: 2013

Geology Professor J. Van Brahana (hydrogeology) joined the faculty in 1990, retired in 2013, and continues to be active as Emeritus Professor. His former students established this scholarship to benefit geoscience graduate students working in the area of hydrogeology.

#### **DEVON ENERGY SCHOLARSHIPS**

Established: 2013

Generous support of geology students by Devon Energy Corporation.

#### **CHESAPEAKE ENERGY GRADUATE FELLOWSHIP** Established: 2007

Generous support of geology students by Chesapeake Energy Corporation.

#### **MALCOLM K. CLEVELAND ENDOWMENT IN GEOSCIENCES**

Established: 2007

Geography Professor Malcolm Cleaveland (paleoclimate, dendrochronology) joined the faculty in 1990, retired in 2006, and continues to be active as Emeritus Professor.

**MATTHEW EDMONDS GEOLOGY AWARD**

Established: 2009

Following Matt Edmonds tragic death in a bicycle accident, his family established this scholarship to benefit deserving geoscience student.

**W. JOE EDWARDS, JR GEOLOGY FUND**

Established: 1975

Following the tragic death of geology graduate student W. Joe Edwards, his family established this scholarship to benefit geology majors at any level. W. Joe Edwards is the department's oldest scholarship.

**DAN GABOR MEMORIAL FIELD CAMP SCHOLARSHIP FUND**

Established: 1997

Following undergraduate geology major and track star Dan Gabor's tragic death, his family established this scholarship benefitting geology majors (BS/MS) with academic potential or financial need, as well as geology field camp participants.

**GEOVISION**

Established: 2019

It has long been noted that giving restrictions from the named scholarships make funds unevenly available to students.

GeoVision is an unrestricted student support scholarship account created to support students at any level and in any Geosciences degree program.

**KERN CHANDLER JACKSON GEOLOGY ENDOWMENT**

Established: 2010

Geology Professor Kern C. Jackson (mineralogy, igneous and metamorphic) joined the faculty in 1952 after a navy career that included receiving the Purple Heart and surviving the Pearl Harbor attack onboard the USS Phoenix. He taught lithology and mineralogy, served as Department Chair 1954-59, retired in 1982 and was Emeritus until passing in 2008. This scholarship benefits geology majors who have an emphasis in petroleum geology and financial need.

<b>ENDOWED BALANCES</b>	
	<b>2019-20</b>
PhD-Fellowship2	\$739,922
PhD-Fellowship1	\$598,783
Jackson	\$316,641
Peppard	\$269,731
Warmath	\$151,003
GeoVision	\$149,339
Manger	\$125,884
Gabor	\$119,299
Zachry	\$118,510
Liner	\$88,532
Redifer	\$86,937
MacDonald	\$78,382
Quinn	\$60,586
Morrison	\$58,105
Brahana	\$47,841
Mussett	\$46,170
Cleavland	\$45,442
Keisler	\$42,632
Sherman	\$36,887
Tucker	\$25,503
Gentry	\$24,969
Edwards	\$21,069
<b>Total</b>	<b>\$3,252,167</b>

#### RONNIE S. AND DORIS A. KEISLER ENDOWED SCHOLARSHIP FUND

Established: 1998

Ron Keisler was a UA geology student (BS 1970, MS 1972) who retired as Vice President of Marathon Oil Company and has been a member of the Geosciences External Advisory Board. Kiesler established this scholarship to benefit geology majors at any level of academic merit or in financial need.

#### JEFF LINER GEOLOGY SCHOLARSHIP

Established: 2009

Jeff Liner (1953-2012) was a UA geology student (BS 1975, MS 1979) who worked as a petroleum geologist with several companies including Cities Service and Panther Exploration. The Liner family established this scholarship to benefit BS/MS geology students.

#### WALTER L. MANGER ENDOWED SCHOLARSHIP Established: 2009

Geology Professor Walter L. Manger (paleontology, stratigraphy) joined the faculty in 1971, served as Department Chair 1985-92, retired in 2008, and continues to be active as Emeritus Professor. The Manger scholarship benefits geology majors (BS/MS) including those transferring from other programs, and those in financial need.

#### HAROLD C. MacDONALD ENDOWED MEMORIAL AWARD

Established: 2015

Professor Harold C. McDonald (remote sensing, petroleum geology) joined the faculty in 1971, retired in 1998, and served as Emeritus Professor before passing in 2014. He was a member of NASA's Shuttle Imaging Radar Development Team and recognized by an Outstanding Achievement Award. This scholarship was established by his former students to benefit deserving geoscience students.

#### JAMES D. AND DONA K. MORRISON SCHOLARSHIP IN GEOSOGY – Established: 2010

James D. Morrison was a geology student (MS 1971) who established this scholarship for worthy students in the geology program.

#### JACK D. MUSSETT SCHOLARSHIP FUND

Established: 1985

Jack D. Mussett was a UA geology student (MS 1952) who established this scholarship to benefit geology students who have high academic achievement and exhibit leadership skills.

#### VERNON PEPPARD SCHOLARSHIP FUND

Established: 1981

Vernon Peppard was a UA geology student (BS 1949) who founded GEOMAP COMPANY in 1959 and established this scholarship to benefit geology major with high achievement or financial need. His daughter Katherine Brewer continues to lead privately held GEOMAP.

#### PHD FELLOWSHIPS IN GEOSCIENCES

Established: 2013

With matching funds from the Walton Family Foundation, alumni donors have raised over \$1M to support Geoscience PhD Fellowships.

#### JAMES HARRISON QUINN MEMORIAL SCHOLARSHIP FUND

Established: 1978

Professor James Quinn (paleontology, stratigraphy) joined the faculty in 1955, served as Department Chair 1959-71, retired in 1972 to open a slot for Walter L. Manger, and passed in 1977 while collecting fossils in a Nebraska quarry. The Quinn scholarship benefits geology students with high academic achievement and financial need.

#### CHARLES BRITTON REDIFER ENDOWED GEOLOGY SCHOLARSHIP

Established: 2008

Following undergraduate geology major Britton Redifer's tragic death, his family established this scholarship to benefit geology majors with good grades and financial need.

#### ROBERT L. TUCKER MEMORIAL ENDOWED SCHOLARSHIP FUND

Established: 1996

The Tucker family established this scholarship in honor of geologist Bob Tucker to benefit BS geology majors of academic ability with financial need.

#### GEORGE HOYT WAGNER AWARD

Established: 2012

George Hoyt Wagner was a UA geology student (MS 1974) who established this scholarship to benefit Geoscience students emphasizing geochemistry in their studies.

#### ALEX T. WARMATH ENDOWMENT FOR GRADUATE ASSISTANTSHIPS IN PETROLEUM GEOLOGY

Established: 2011

Alex Warmath was a UA geology student (BS 1975, MS 1977), was a founding member in 2006 of the Geosciences External Advisory Board, is currently president of K3 Oil L.L.C., and established this scholarship to benefit graduate assistantships in petroleum geology.

#### DOY L. ZACHRY ENDOWED SCHOLARSHIP

Established: 2008

Geology Professor Doy L. Zachry (stratigraphy, petrology) joined the faculty in 1968, served as Department Chair 1992-99, retired in 2016, and continues to be active as Emeritus Professor. His 48 years as active faculty is 2<sup>nd</sup> longest of any UA geology professor. The scholarship benefits geology and earth science majors as well as geology field camp participants

Scholarship account spending amounts for Apr 2020 are shown below. Historically, most of the department scholarship accounts point at geology majors, but the green highlight scholarships can be applied to geography majors.

### **Faculty Diversity**

At first glance the Geosciences Department diversity (gender and ethnicity) efforts do not seem impressive however it is worth taking a deeper look at the faculty demographics. In 2009, according to the university records the Geology and Geography departments, combined (as they are in later years), reported gender in 2009 as 14% of the faculty identifying as female in the Geology and Geography programs as compared to 39% of the Fulbright College of Arts faculty. Even? The future Department of Geosciences was below their college averages. In 2013 for our last external review we recognized the problem and were beginning to make changes. By 2019 Fulbright College had 45% female faculty and Geosciences had 31%.

Over the last ten years the department has made a conscious decision to strive for a more diverse faculty. It is well understood that one of the keys to attracting a more diverse student population is the ability for students to see people that look like them on the faculty. The last ten years of the program history has seen a consistent increase in underrepresented and female faculty hires. We are still choosing the best candidate for each position but are more effectively recruiting top candidates from more diverse backgrounds.

Ethnicity is a more problematic snapshot and harder to quantify. While we are making progress, the newer biographical sheet offers faculty the choice to not identify their ethnicity and faculty are choosing not to disclose this information (8% in Fulbright and 24% in Geosciences). For the table below these unknowns are not included. We also acknowledge that there are many additional ways people can be identified but we used only indexes that were used at the last review so we could observe changes.

We should not view this table {define URR?} as an exercise in reducing people to tick marks in a specific category. What we are interested in are the trends. While the University of Arkansas Fulbright College of Arts and Sciences started out with more diversity in the faculty than the Department of Geosciences, we have had a steady increase for the last ten years and have actually increased our gender diversity by more than our college at large. Are we where we need

to be? Not yet, but we are able to assess from these trends that what we are doing is moving us in the right direction.

Year	GEOS Faculty		Fulbright Faculty	
	Female %	URR %	Female %	URR %
2009	14	10	39	14
2013	28	29	39	17
2019	31	22	45	24

### Geosciences Staff

The support staff of the Geosciences

Department has changed over the past 3 years. The Administrative Support Supervisor, Jacqueline Shearman came onboard in June 2018, replacing Teresa Center who had been with the department for 20 years. Jessica Eckberg is the Administrative Specialist II and started with the department in August 2019. The department has also added Ashley Chua in July 2019 as a part-time Fiscal Support Specialist. JoAnn Kvamme, Assistant Director of ENDY, also lends her institutional expertise to the department having been with the university since 2002. Below is a breakdown of their roles/duties:

#### Admin Support Supervisor

Admin Support Supervisor, Jackie Shearman, started in the Geosciences Department in June 2018. She is responsible for carrying out the Chairs departmental directives and managing the Geosciences office. Her major responsibilities break down into three major categories:

*Personnel:* Jackie is responsible for guidance and evaluation of the Administrative Specialist II and Fiscal Support Specialist. She also assists in the hiring procedures and search for new faculty, staff, students, and hourly workers. She ensures a smooth transition into the university system from travel arrangements and itineraries for candidate visits to campus through their hiring paperwork. Once they are hired she continues with onboarding processes and employee files for everyone in Geosciences.

*Budgets:* She is responsible for all the Geosciences budgets. She handles all faculty and student payroll including extra compensation, summer pay, leave, stipends, and tuition waivers for students. She also acts as the liaison between the Geosciences Department and Fulbright College Dean’s office. Additionally, she is responsible for maintaining budgets and interdepartmental transactions for maintenance, TELE funds, RIF accounts, startups, and Foundation/gift accounts. She shares purchasing tasks with the Fiscal Support Supervisor however Jackie remains the overseer of the transactions.

*Departmental Functions:* As the departmental supervisor she is responsible for organizing and implementing any function of the department which include four major categories: 1) all departmental functions including retreats, gatherings, etc., 2) assists in travel and hotel arrangements for the weekly colloquium speakers, 3) planning for the meetings of the

Geosciences Advisory Board which include hotel accommodations, travel, event planning, updating and creation of informational material packets for members, and taking the minutes of these meetings twice a year, and 4) she organizes, takes notes, and follows through with decisions from monthly faculty meetings.

### **Administrative Specialist II**

Jessica Eckberg was hired as an Administrative Specialist II in September 2019. Her duties consist of service provided via phone, in person, and/or through email. She is the face of the department greeting and assisting visitors, students, staff, and faculty who come into the office. She manages the office front desk operation and maintains alumni contact through social media and newsletter. She composes, types, edits various documents including letters, reports, forms, and training materials as requested by the Chair or Supervisor. She also helps supervise student office assistants. Additionally, her assignments are broken down into two categories:

*Organizational management:* She works with faculty to adjust and correct errors in class scheduling using CourseLeaf, utilize UAConnect to research information, perform functions such as overrides for student course enrollment and remove advising holds. She is also responsible for the department inventory, surplus maintenance, and hourly time entered using BASIS. Jessica also updates the department website in OmniUpdate and provides basic technical assistance to department students, staff, and faculty.

*Manage office and building functions:* She is responsible for reserving rooms, department vehicles, and other equipment. She maintains stock of office supplies/equipment, approves and post announcements in hallways, and monitors building access via card readers and authorized card-holders issues and maintains a record of keys distributed to faculty staff and students. She assists in preparations and implementation of various department events, on and off campus and takes care of general office needs such as sending and receiving packages and the organization of office files and supplies.

### **Fiscal Support Specialist**

Rahmawati Ashley Chua was hired as Fiscal Support Specialist in July 2018. She is responsible for assisting the Support Supervisor with budgetary matters.

*Budgetary Support:* she provides research program support in pre and post award management. She works with the Office of Research and Sponsored Programs and Research Accounting office in assisting Geosciences faculty in fiscal and administrative responsibility to maintain standard operational efficiencies. She also serves as the accountant for departmental fiscal operations, research accounting and fiscal reporting, oversees Department Procurement activities,

monitoring, reviewing, and managing sponsored projects and Start up expenditures and activities. She additionally processes summer research salary and project-related expenditures.

### **Jo Ann Kvamme - Assistant Director Environmental Dynamics**

Environmental Dynamics (ENDY) is interwoven with Geosciences, which was one of the three original partners in the ENDY program implementation. It was also home to Administrative personnel for ENDY for over 15 years. As a favor to Geosciences and as thanks for her office space, Jo Ann assisted with needs in the Geosciences program since many times, they were joint needs. Her duties mainly address:

*Diversity and Recruiting:* While not directly part of her ENDY assignment she has been very active in diversity initiatives for increasing diversity in Geosciences and ENDY. This includes being the national student liaison for the National Association of Black Geoscientist (there are Geosciences and ENDY students who are part of this organization), facilitating student participation in the conference annually, and hosting their annual conference twice for Geosciences and ENDY (we have been a part of this organization since 2005). She is also the lead organizer for the summer Math, Science, and Engineering Scholars summer camp coordinated through a MOA with Fort Valley State University. They arrange for underserved rising high school juniors from around the country to visit our campus for a summer camp in Geology and Engineering (the last 10 years).

While the department and program were always separate (budget) our directives often were the same and the department and program benefited from the collaborative work. Jo Ann was used as a recruiter for Geosciences (and ENDY), support person for diversity initiatives in the department, helped students (many ENDY students had teaching assignments in Geosciences), organized conferences, and assisted with administrative duties when needed.

*Assistance with student and faculty needs:* In 2016 ENDY moved the office to a new home in MAIN. Being relocated to her new office has allowed space for the Accounting personnel who she shares a desk (Ashley) alternating time in the office. While Jo Ann's office has changed, she makes sure to spend one day each week working with faculty, students, and staff since many of the challenges and efforts Jo Ann encounters affect both units.

It has turned out that Jo Ann has outlasted all the administrative people who were in the department when she was hired in 2002 and is now the source of administrative institutional knowledge in the department. Since the department staff is quite new (all less than three years in the department) she assists staff, students, and faculty, helping resolve simple and complex problems, and has a willingness to chip in where needed.

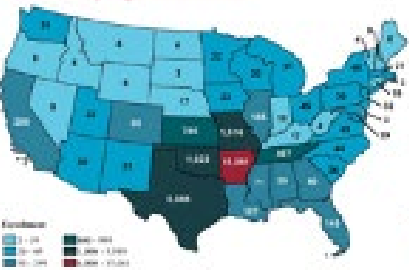


## B. Quick facts about the University of Arkansas

Tuition And Fees



Enrollment By Legal Residence State



Enrollment not shown on map: Alaska - 12, District of Columbia - 2, Nevada - 4, International - 1,611

Rankings (public institutions only)

- 2018 U.S. News & World Report**
- Supply chain logistics (graduate).....11<sup>th</sup>
  - Supply chain management (logistics) (undergraduate).....11<sup>th</sup>
  - Rehabilitation counseling (graduate).....12<sup>th</sup>
  - Management information systems (undergraduate).....16<sup>th</sup>
  - Biological/agricultural engineering (graduate).....18<sup>th</sup>
  - Industrial/manufacturing/systems engineering (graduate).....24<sup>th</sup>
  - Online bachelor's programs.....24<sup>th</sup>
  - Undergraduate business programs.....26<sup>th</sup>
  - Online graduate engineering programs.....39<sup>th</sup>
  - Graduate education school.....43<sup>rd</sup>
  - Online graduate education program.....43<sup>rd</sup>
  - Graduate business school.....54<sup>th</sup>
  - Law school.....47<sup>th</sup>
  - Nursing school-Doctor of Nursing.....55<sup>th</sup>
  - Nursing school-Master's.....56<sup>th</sup>
  - Civil engineering (graduate).....53<sup>rd</sup>
- Online Master in Physical Education ranked 2<sup>nd</sup> in nation by Early Childhood Education Degree
  - Online Education Specialist degree program ranked 2<sup>nd</sup> in nation by Early Childhood Education Degree
  - Pay Jones School of Architecture and Design ranked 19<sup>th</sup> on the 2018 DesignIntelligence list of Top Rated Architecture Schools
  - Walton College of Business' MBA program ranked 41<sup>st</sup> in the "Las OSU's Top 100 U.S. MBA Programs of 2018" by Points and Quants

Information compiled by  
Office of Institutional Research and Assessment  
ADON 114 Fayetteville, AR 72714  
Phone (479) 475-6300 Fax (479) 475-6700

Instructional Faculty (Fall 2018)

	Male	Female	Total
<b>Total</b>	<b>818</b>	<b>983</b>	<b>1,401</b>
Full-Time	718	474	1,192
Part-Time	100	109	209
<b>Ethnicity</b>			
African American	17	21	38
American Indian/Alaska Native	8	8	8
Asian	68	31	123
Hispanic	964	437	1,641
Hispanic/Pacific Islander	0	1	1
Japanese	11	30	41
Non-Resident Alien	35	19	54
Two or More Races	8	22	30
Unknown	52	23	99
<b>Academic Rank</b>			
Distinguished Professor	43	4	44
University Professor	29	5	35
Professor	308	41	347
Associate Professor	153	89	242
Assistant Professor	154	85	192
Instructor	127	232	363
Lecturer	83	103	188
<b>Years Since</b>			
Entered	437	165	464
On Tenure Track	152	100	252
Not Tenure Track	238	336	487
<b>College</b>			
Agricultural Food and U.S. Sciences	108	56	166
Architecture	24	10	34
Art and Sciences	368	285	653
Business	115	49	164
Education and Health Professions	64	130	194
Engineering	111	25	139
Law	28	21	51

**UNIVERSITY OF ARKANSAS**

2018 — 2019  
**Mini Fact Book**

<https://olirark.edu/olirark/factbook/2018-2019.pdf>

**Quick Facts**

- Founded in 1871
- Students, female/male: 53%/47%
- Average freshman high school GPA: 3.72
- Average ACT: 26.5
- Instructional faculty: 1,401
  - Full-time: 1,192
  - Part-time: 209
- Student-to-faculty ratio: 19 to 1
- Research expenditures (fiscal year 2017): \$150,992,965
- Annual University scholarship and fellowship expenditures (fiscal year 2017): \$20,764,370
- Academic programs: 279 degrees and certificates, with 14 major fields of undergraduate study, 79 master's degree programs, 27 doctoral programs, 2 specialist degrees, and 27 certificates

**Public Prizes**

- The University of Arkansas has achieved a Gold rating from the Sustainability Tracking, Assessment and Rating System - STARS - in recognition of campus-wide sustainability achievements.
- The League of American Universities recognized the University of Arkansas with a Silver Medal Friendly University award for 2017, a top honor from 2015's Heisenberg Medal.
- Prestigious, nationally competitive awards (2017-18):
  - 1 Marshall Scholarship (out of 45 nationally)
  - 1 Endeavor Scholarship (of 211 nationally)
  - 5 Fulbright English Teaching Assistantships (Poland, Costa Rica, and Mexico)
  - 4 National Science Foundation Graduate Research Fellowships
  - 4 Global Language Fellowships (U.S. to India, Japan, and Brazil; Brazil to U.S.)
  - 1 DAAD DFG research
  - 1 DAAD DFG Fellowship
  - 1 National Institutes of Health - Angewandte Scholarship

With a total of 25 Thomas Helmer, University of Arkansas ranks 19 in the SDC and among the top 38 public institutions nationwide. With a total of 13 Goldwater Scholar, University of Arkansas ranks among the top 28 public institutions nationwide.

**Carnegie Classification**

**Doctoral University: Highest Research Activity**

**Fall 2018 Enrollment**

**27,778**

62% (5,875 more Fall 2017)

➤ 23,186 Undergraduate

➤ 4,594 Graduate

➤ 888 Law

Enrollment (Fall 2018)

	Undergraduate	Law	Graduate	Total
<b>Total</b>	<b>23,586</b>	<b>368</b>	<b>4,028</b>	<b>27,978</b>
<b>Gender</b>				
Male	11,666	203	1,988	13,656
Female	11,920	165	2,040	14,125
<b>Ethnicity</b>				
White, American	261	37	229	527
American Indian/Alaska Native	226	18	47	291
Asian	182	5	75	265
Caucasian	17,719	287	3,586	21,592
Hispanic/Latino Islander	20	3	23	46
Hispanic	2,080	18	238	2,326
Non-Resident Alien	754	2	717	1,473
Two or More Races	507	19	83	609
Unknown	338	2	83	423
<b>Current Legal Residence</b>				
Arkansas Resident	11,820	286	1,752	13,858
Non-Arkansas Resident (U.S.)	9,649	68	1,275	11,292
Foreign	754	2	717	1,473
<b>College</b>				
Agricultural, Food and Life Sciences	1,274	0	337	1,611
Architecture	871	0	0	871
Art and Sciences	1,228	0	879	2,107
Business	6,141	0	337	6,478
Education and Health Professions	3,982	0	1,295	5,277
Engineering	1,515	0	834	2,349
Independent Study	79	0	0	79
Interdisciplinary	0	0	276	276
Law	0	368	0	368
<b>Student Level</b>				
Freshman	4,517	0	0	4,517
Sophomore	3,227	0	0	3,227
Junior	3,842	0	0	3,842
Senior	6,296	0	0	6,296
Master	0	0	2,528	2,528
Doctorate	0	0	1,477	1,477
Professional Year 1	0	132	0	132
Professional Year 2	0	171	0	171
Professional Year 3	0	103	0	103
Master of Law	0	22	0	22
Master's Certificate	0	0	7	7
Graduate Non-Degree	0	0	124	124
Graduate Specialist	0	0	16	16
Undergraduate Certificate	5	0	0	5
Graduate Certificate	0	0	48	48

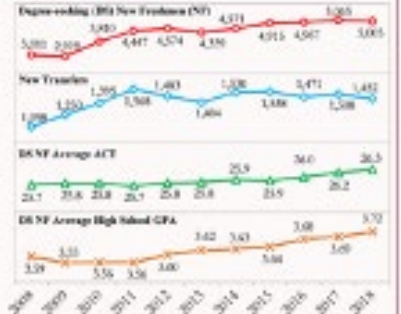
Degrees Awarded, 2007-2018

	Male	Female	Total
<b>Total</b>	<b>3,862</b>	<b>3,295</b>	<b>7,157</b>
<b>Level</b>			
Baccalaureate	3,072	2,506	5,578
Master's	389	321	710
Specialist	3	3	6
Doctoral - research/scholarship	132	72	204
Doctoral - non-professional	76	58	134
Certificate of Proficiency	2	3	5
Graduate certificate	83	44	127
Post-master certificate	3	3	6

Enrollment Trends



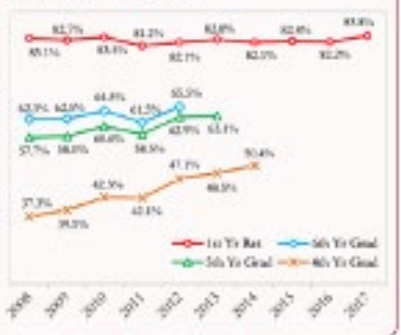
New Student Trends



Credentials Awarded Trends



Retention and Graduation



Degrees Awarded, 2007-2018 (cont'd...)

	Male	Female	Total
<b>Enrollment</b>			
African American	139	547	686
American Indian/Alaska Native	35	38	73
Asian	79	74	153
Caucasian	2,301	1,407	3,708
Hispanic/Latino Islander	2	3	5
Hispanic	177	244	421
Non-Resident Alien	226	283	509
Two or More Races	54	301	355
Unknown	28	23	51

Degrees Awarded, 2007-2018 (cont'd...)

	Male	Female	Total
<b>College</b>			
Agricultural, Food and Life Sciences	384	362	746
Architecture	33	41	74
Art and Sciences	648	1,037	1,685
Business	977	677	1,654
Education and Health Professions	281	750	1,031
Engineering	778	298	1,076
Interdisciplinary	32	39	71
Law	87	86	173

Cannot read these 2—is there a link to go to instead?

### C. Academic Program Review of the Department of Geosciences – 2014

#### External Reviewers Report again the date?

The report prepared by the External Reviewers will be used by the Arkansas Department of Higher Education to verify the student demand and employer need for the program, the appropriateness of the curriculum, and the adequacy of program resources. The report should not include a recommendation on program continuation or program deletion. The External Reviewers written report must include a summary of each area assessed and should provide examples that document the conclusions. The questions below should be used by the reviewers as a guide in preparing the summary for each area. Responses to the questions should not be simply “yes or no”.

#### Introduction

The External Review team consisted of Professor Christopher Fielding, Coffman Chair of Sedimentary Geology from the Department of Earth and Atmospheric Sciences at the University

of Nebraska Lincoln, Professor R. Mark Leckie, former Department Head from the Department of Geosciences at the University of Massachusetts Amherst, and Professor Thomas Costello from the Department of Biological and Agricultural Engineering at the University of Arkansas and the University Program Faculty Committee representative (U of A). We note here that Professor Leckie comes from an academic unit that combines the disciplines of Geology and Geography, similar to the U of A Department of Geosciences. The review team met on the campus of the University of Arkansas Fayetteville on March 30-April 1, 2014. Dr. William Warnock, Project/Program Director at U of A served as our liaison with the Department of Geosciences.

We note at the outset that Geosciences is a strong department with the potential to reach broader acclaim through their strengths in a number of areas, including geospatial technologies and petroleum-related fields. The connections with alumni and a variety of industries represent a genuine value-added dimension for the Department, College, and University.

### **I. Assessment of Program Goals, Objectives and Activities**

- A. How are the faculty and students accomplishing the program's goals and objectives?
- B. How is the program meeting market/industry demands and/or preparing students for advanced study?
- C. Is there sufficient student demand for the program?
- D. Are the levels of course enrollments and/or program completions sufficient for the program resources required?

The department offers three undergraduate degrees in Geology, Geography, and Earth Sciences, with reasonable numbers in the three majors. They offer a MS in Geology, MA in Geography, and a new PhD in Geosciences. These numbers are also solid relative to many other departments of similar size and resources. We note that undergraduate and graduate enrollments have increased by >80% since 2006. They also participate in the interdisciplinary PhD programs in Environmental Dynamics, and Space and Planetary Sciences. They provide large enrollment service courses for the University Core Curriculum. The total number of Student Semester Credit Hours (SSCH) taught in 2013 was 23,281 of which 22,348 (nearly 96%) were at the undergraduate level. This is an increase of 7,717 (50%) from 2007.

The department has a strong undergraduate program in all three areas of concentration, and many BA and BS graduates go on to graduate school for Geology or Geography at U of A and elsewhere. Although many in the industry typically hire entry level professionals with an MS degree, some BS graduates from the program are also finding employment in the hydrocarbon industry. The graduate students are aware of career opportunities and mentioned that the strong placement record of U of A Geosciences graduates in industry is a very favorable attribute of the

program. The U of A Geosciences graduate program has an excellent rapport with the hydrocarbon industry as evidenced by the number of their graduates that land permanent positions following completion of a Master's degree.

## **II. Assessment of Program Curriculum**

- A. Is the program curriculum appropriate to meet current and future market/industry needs and/or to prepare students for advanced study?
- B. Are institutional policies and procedures appropriate to keep the program curriculum current?
- C. Are program exit requirements appropriate?

As noted in the section above, the undergraduate programs are strong. They are preparing students for advanced study, and to meet the needs of industry. However, after talking with undergraduate students, and current grads who completed their undergraduate degrees at U of A, it seems clear that program-specific curriculum and career advising directly from the Geosciences faculty would be helpful. We suggest formalizing the advising by appointing a Chief Undergraduate Advisor for each of the three majors. According to both the graduate students and some faculty, the Graduate Student Handbook needs to be updated. We suggest that all incoming MS and PhD students be issued with a copy of the handbook upon their arrival.

Capstone courses in geology and geography would be a helpful way to tie together some of the disparate but foundational aspects of the disciplines. Students could also benefit from more quantitative skills; the students are hungry for these skills. We encourage faculty to incorporate more quantitative skills/data analysis in both undergrad and grad classes. Can CAST contribute here? Apparently, two research methods courses are being undersubscribed.

Undergraduate students are largely unaware of research opportunities that might be afforded them in the department. Gaining some research experience through an independent study or senior research/thesis opens doors for U of A graduates applying to other programs for graduate school. We encourage the Geosciences faculty and Undergraduate Advisors to discuss the advantages of gaining research experience as an undergraduate, and providing opportunities for Geosciences majors in labs, in the field, or working in parallel with their graduate students.

We are of the opinion that exit exams are not needed; this would add to the demands on faculty time, which are already high, particularly junior faculty. The current process of validation that students meet the degree requirements is a sufficient exit requirement.

Lastly, there were concerns raised about certain aspects in the large-enrollment Introductory Geology course. There were suggestions for improvements that would seem to be easy fixes/tweaks. For example, seek better coordination of the lecture and the lab. Replace the lab

manual, which many of the graduate student TAs found difficult to use and for the students to understand. Standardize the intro lab classes a bit more; overhaul of content, including less rocks and minerals and more on Earth systems processes. A one-day local field trip would provide very valuable hands-on experiential learning, as well as improved camaraderie as only a well-run field trip can do. We suggest that the faculty and grad students meet to share ideas for building a better intro geology experience for U of A undergrads and prospective Geosciences majors.

### **III. Assessment of Program Faculty**

- A. Do program faculty have appropriate academic credentials and/or professional licensure/certification?
- B. Are the faculty orientation and faculty evaluation processes appropriate?
- C. Is the faculty workload in keeping with best practices?

All faculty hold a PhD in their respective fields, which is appropriate. No other professional certification or licensure is relevant. Challenges remain in having such a diverse group of faculty in a single department spanning the natural and social sciences. Ideas were floated about how to improve the communication between and among the geologists and geographers, particularly the graduate student community. One suggestion is to offer a new grad student field trip at the start of the fall semester highlighting cultural and economic geography and local geology of the Fayetteville area; followed by a dinner for all grads and faculty.

As noted above, undergraduate general education teaching has increased substantially in recent years. The hiring of several lecturers to teach many of these large-enrollment classes has helped ease the strain, yet the core faculty are teaching 4 courses a year, which is very high for an R-1 University. With heavy research responsibilities and expectations for further development of graduate programs, it would be a reasonable goal to move toward a teaching load of 3 courses per year for tenured and tenure-track faculty.

Faculty orientation and evaluation processes are appropriate and rigorous.

### **IV. Assessment of Program Resources**

- A. Is there an appropriate level of institutional support for program operation?
- B. Are faculty, library, professional development and other program resources sufficient?

The overall level of institutional support for the program allows functionality, but we feel that future improvement will require modest investment in human resources (see below). Given the University of Arkansas' espoused ambition of attaining top 50 ranking among U.S. public universities, such investment would seem to be both worthwhile and potentially transformative.

Graduate student stipends are anomalously low. There is no doubt that this shortcoming directly affects both the number and quality of potential graduate students applying for and accepting offers at the U of A. This will be discussed further below. We did note that the Graduate School provides travel support for PhD and MS students to attend one professional meeting per year; this is a valuable contribution in support of graduate student education and training. There is also limited fellowship (and some scholarship) support available to supplement stipends for the most talented applicants. However, the base stipend should be increased to at least a regional average for the disciplines.

The Geosciences administrative staff are outstanding, dedicated, and valued individuals, but it is noted that their pay is woefully low given their level of responsibility and years of service.

The department has limited technical support. For example, there is no technical support to assist in the maintenance of field and laboratory equipment, and there is limited support for a new clean lab and instrumentation needed for a recently hired faculty member. The lack of support in this latter case should be a major concern if this junior faculty member is to be successful in her research program, while also providing a full complement of required teaching. One notable bright spot is the stable isotope facility, which is supported by a full-time technician and assistant; this is a great asset in support of research by the faculty and graduate students in the Department of Geosciences.

## **V. Assessment of Instruction**

- A. Are courses offered/delivered in accordance with best practices?
- B. Is technology infrastructure current?
- C. Does the institution have appropriate procedures in place to assure the security of personal information?
- D. Are technology support services appropriate for students enrolled in and faculty teaching courses/programs utilizing technology?
- E. Are policies for student/faculty ratio, faculty course load and intellectual property in accordance with best practices?

Courses offered under the undergraduate and graduate degree programs are appropriate for their purpose and are delivered according to best practices. We nonetheless offer the following observations on some aspects of course offerings based on interactions with students, instructors, and faculty.

Some challenges to the successful delivery of undergraduate core courses have arisen in recent times due to loss of key faculty. One particular example is the restructuring of undergraduate

mineralogy and petrology, which were recently combined into a single course and taught by a relatively new faculty member. This caused unreasonable stress on the faculty member concerned and was not well received by the students who felt that too much material was crammed into a single course. The students also commented on the lack of a modern stratigraphy course in the curriculum.

The issue of capstone courses was raised in several discussions. The desire to offer a classroom-based capstone course in Earth Systems History is laudable, but may not be practicable, and the question arises as to why Field Camp cannot serve as an effective capstone course for the Geology program. A capstone course for the Geography Bachelors' program would be a valued addition.

The need to make introductory Geology courses more accessible and enjoyable for students, particularly for non-majors, was also a recurring topic of discussion. A popular potential solution is to offer a one-day field trip around mid-term, in order to teach geological concepts more effectively and to establish a sense of community among student groups.

Several critical comments were made concerning the structure and effective execution of the graduate programs within the Department. The Department needs to standardize procedures and communicate expectations clearly. There should be an up-to-date Graduate Handbook, and this should be issued to every incoming graduate student. Graduate students should be admitted to the Department only if there is a faculty advocate for them who has certified that they are willing to act as advisor and arrange a research project. There should be regular milestones set up as metrics of progress, both for MS and PhD program students.

There should be a single Chief Undergraduate Advisor and Chief Graduate Advisor chosen from among the Department faculty for each discipline area. We recommend the establishment of a Foundations course for incoming graduate students, which should be mandatory and could be team-taught. Such a course would provide upfront training in a variety of essential, generic professional skills and methodologies, such as scientific writing, grant proposal preparation, scientific ethics, time management, library skills, field and lab safety, etc. This will ensure that expectations of student performance are explicitly set out at the commencement of a student's graduate program. We feel that formal structures such as this will assist significantly in developing the Masters program, and especially the new PhD program.

Technology infrastructure is current, and of high quality. Security of personal information appears sound, as far as we can tell. Access to technology support is good, although students expressed a desire for more coordinated training in software usage. Perhaps the superbly resourced CAST could assist significantly in this regard.

Policies for student/staff ratios, faculty course loads, and intellectual property appear broadly sound. We note, however, that an annual faculty course load of four courses is a major hindrance to faculty research productivity and is likely to put unreasonable pressure on junior faculty as they progress towards pre-tenure reviews. We suggest performing a review of course offerings. We recommend combining senior undergraduate and graduate classes so as to expand the range of elective offerings and offering those courses every alternate year in order to decrease the faculty teaching load.

## **VI Assessment of Program Effectiveness**

- A. Indicate areas of program strength.
- B. Indicate the program areas in need of improvement within the next 12 months; and over the next 2-5 years.
- C. Indicate areas for program development.

The Department appears to cover the breadth of discipline areas fairly evenly, and thus offers a balanced curriculum at both undergraduate and graduate levels. Individual faculty members have strong profiles within their fields of research. Additionally, the Department shows clear strength in the fields of Advanced Spatial Technologies (Geography) and in Petroleum Geoscience (Geology), with emerging strength in various dimensions of geochemistry. There are significant synergies between the two disciplines that are being actively developed and hold much promise. In particular the location of Fayetteville within a currently prospective oil and gas basin provides the University of Arkansas with a significant opportunity to develop externally funded initiatives in these areas.

Areas in need of program improvement are details, rather than major concerns, and are covered under item V. The Department appears to have no strategic plan and would benefit from the exercise of developing such a 5-year document. This would give stakeholders a clear understanding of priorities and needs for the foreseeable future, particularly with respect to future hires.

Areas that would benefit from program development include aspects of sedimentary geology. There seems to be a growing demand for courses in this field, in large part driven by the expanding profile of petroleum geoscience in the Department.

## **VII. Report Summary**

- A. Include comments on the need for program completers/graduates in the local area, region and/or nation over the next 5 years.
- B. Include comments on overall program quality, program need, state program review process, etc.



The Department is performing strongly in all aspects of its mission. All undergraduate and graduate programs are well subscribed. All faculty are active in teaching, and in research. Many faculty have been successful in securing significant external funding. Junior faculty are shielded from onerous service duties. Office and lab support staff are performing to a consistently high level. Graduate student morale is high. Timeframes to completion of further degrees are within reasonable limits. Alumni are strongly supportive of the Department. The newly established PhD program will likely prove to be a major asset in the foreseeable future.

A major impediment to future development of the graduate programs in the Department is the extraordinarily low level of graduate student stipends. It is clear that the Department cannot presently compete effectively with peer institutions for new graduate candidates. Remuneration for support staff also appears to be anomalously low.

Graduate programs need a more structured approach, with Chief Advisors nominated for each discipline from among the Department's faculty, a Foundations Course for incoming graduate students, and a formalized series of milestones to be set for all graduate students. The undergraduate programs would also benefit from the appointment of a Chief Undergraduate Advisor for Geology, Geography, and Earth Sciences.

Attention must be given to reducing faculty teaching loads from 4 to 3 courses per annum or less. Present loads are impeding faculty research productivity, and causing unreasonable stress levels for junior, untenured faculty.

If not done already, we would like to suggest a regular strategic planning activity or internal review (retreat) for faculty to take a look at existing programs and to consider improvements. Development of a five-year strategic plan would help set goals for hiring and growth in areas that will keep the programs current in key research areas and in line with changing needs for geoscientists in the future.

The University of Arkansas has stated its objective of attaining top-50 status among U.S. public universities. In order for the Department of Geosciences to attain a level of performance commensurate with such status, some modest changes to the support structure are necessary, along with some modifications to the modus operandi as expounded in the above report. If the department wants to invest in the cutting-edge science that comes with high-tech geophysical and geochemical instrumentation, then appropriate investment in technical support must also be made in order for faculty to be successful in generating external funding, supporting graduate students, and publishing in the best journals in the field. To promote continuity of the specialized technical support required to maintain operations of high-tech instruments, more hard funded support is needed for technician positions.

Lastly, we note that several of the most recent hires have been women; this is a great step in the right direction.

Additional University of Arkansas Fayetteville question:

What evidence is there of support provided for recruitment and retention of qualified students, and of support for student progress toward and achievement of graduation or program completion?

As mentioned above, graduate stipends are extremely low, and we believe that graduate teaching assistant stipends are unreasonably low while the workloads are high. This is causing severe problems both in graduate student recruitment and retention. A more formalized advising structure to the graduate program, as discussed in item V, is considered a high priority for the Department. We recommend that all graduate students admitted to the MS or PhD programs have a faculty advocate who will serve, at least initially, as the advisor for that student.

Recruitment and retention of qualified undergraduate students could be improved by greater communication about the diverse career potential in the geosciences, as well as a more formalized advising structure to ensure timely progress and provide specific guidance for future opportunities in the field.

Responses to the areas of concern in the 2014 report can be found in Appendix D.

## **II. Program Goals**

The Department of Geosciences creates and disseminates knowledge about Earth/human processes and properties for students, scientists, and the public to help create a scientifically informed community. We provide high quality educational opportunities for students seeking PhD, MS, and BS degrees in core strength areas of climate, GIScience, human geography and geology. We support student success and retention with career advising and inclusive activities to align educational goals with career goals. In all programs, we enable students to discover and develop relevant knowledge and skill sets so that they can achieve their professional goals and pursue solutions to challenges facing the state, nation, and world.

### **Earth Science BS (ERSCBS)**

The skills developed in an Earth Science BS degree include research methods and attention to detail, ability to work independently and collaboratively, ability to gather, assess and interpret data, and an understanding of the composition of the earth and the processes that operate on it. Because the program includes only minimum science requirements, it is expected that most

students will use some of their elective credit hours to strengthen their science backgrounds in areas other than geography and geology. These areas of additional study will be determined through consultation between the student and the adviser.

#### Geography BA (GEOGBA)

The geography degree prepares students to become an environmental consultant, work in industry, join or start a non-profit, start a career in international development, or put their education to work in the US Geological Survey or US Forest Service, among many others. Students may choose either the normal geography degree program or the concentration in cartography and remote-sensing GIS. The program also offers two minors: geography and historic preservation.

#### Geology BA (GEOSBA)

The goal of the program leading to the Bachelor of Science degree in Geology is to provide students with a broad spectrum of the various sub disciplines of geology, while at the same time honoring an emphasis in the traditional areas of mineralogy, igneous, metamorphic and sedimentary petrology, structural geology and stratigraphic principles. This curriculum will prepare students to enter graduate programs without deficiencies at the University of Arkansas or other established programs.

#### Geospatial Technologies Certificate (GISTCP)

The Department of Geosciences also offers an online Geospatial Technologies Certificate through the University of Arkansas Global Campus. The certificate is designed for working professionals who wish to develop basic skills in the emerging field of geospatial technologies. Instruction prepares these individuals for employment in the geosciences and collateral disciplines as well as providing a foundational skill set for additional advanced work if desired. The certificate will also benefit students in two-year associate degree programs as well as undergraduates in four-year programs who wish to strengthen their skills.

#### Geography MS (GEOGMS)

The Department of Geosciences offers a Master of Science (M.S.) degree in geography. This program draws on a variety of faculty expertise in physical, environmental, human, and regional studies in geography as well as in cartography, remote sensing, photogrammetry, and computational aspects of geographic information science (GIS) or geoinformatics. Careers directly related to the Geography MS degree include cartographer, environmental consultant, geographical information systems officer, urban planner, geomorphologist/physical geographer, natural resource manager, planning and development surveyor, and secondary school teacher among others.

#### Geology MS (GEOLMS)

Instruction in geology at the graduate level focuses on preparation of students to become practicing professional geologists in industry or to pursue, without deficiencies, doctorates at established programs. Students intending to enter the industrial workforce are encouraged to maintain a broad perspective with an emphasis in an area of geology that has a demonstrated record of past employment, such as petroleum geology or environmental geology. The greatest strength of the program in geology at the University of Arkansas is instruction in practical geologic interpretation, with emphasis on field relationships. This instructional strength includes all levels of teaching and supports an active research program that serves to strengthen the research and communication skills of the students through writing assignments, oral presentations, and participation in professional societies.

#### Geospatial Technologies Certificate (GISTC)

You may already be a geospatial professional, interested in expanding your knowledge and skill set, or you may be new to the field, interested in joining one of the fastest growing areas of technology. The US Department of Labor has defined geospatial technologies as one of three major technology growth areas. Geospatial technologies are becoming central skills in environmental, energy, agribusiness, marketing, logistics, local, county, state and federal government and many other professions.

#### Geosciences PhD (GEOSPH)

The Department of Geosciences focuses on research and education dealing with the nature, genesis, and history of the Earth and the global environment, the evolution of landscapes and biota at the Earth's surface, and the advance of geospatial technologies. The Doctor of Philosophy degree is designed for students who are committed to scholarship in the geosciences and who wish to prepare for professional employment within the academic community, industry, or government. Geosciences research requires rigorous observation, quantitative analysis, and modeling in order to yield scientific results that are acceptable for publication in first-rate, internationally ranked journals. Given the interdisciplinary nature of Geosciences, the Department of Geosciences encourages research including elements of space and planetary sciences, biological sciences, environmental sciences, physics and chemistry to address relevant problems at the boundaries of geoscience and other disciplines.

### **III. Student Learning Outcomes**

The overarching objectives for the six core programs in the Department of Geosciences (BA/MS Geography, BS/MS Geology, BS Earth Sciences, PhD Geosciences) are the same and reflect shared resources and faculty among all programs. The Department also recognizes that different specific skills are required for the Geography and Geology programs, which are manifested in the learning objectives that address exposure to leading-edge research in the disciplines, familiarity with relevant technologies, and mastery of fundamental knowledge and skills in the fields. Also, the BS program in Earth Sciences has slightly different objectives with

the emphasis on preparation of students with broader backgrounds than those in the Geology BS and Geography BA, which allows them to pursue options other than scientific careers (i.e. professional degrees, such as K-12 education, business, or law) after graduation. Because the preparation in science is less rigorous with this degree, it is expected that most students will use their electives to strengthen their scientific and/or pertinent backgrounds in courses outside geology or geography.

Objectives are separated by category into learning, research, and service. The learning objectives are expectations for students, whereas research and service are expectations for the faculty.

### **Learning objectives for students**

1. *Communicate effectively both orally and in writing*
2. *Organize and analyze information quantitatively and qualitatively*
3. *Critical thinking*
4. *Appreciate diversity*
5. *Know how to use state-of-the-art technology and related skills*
6. *Demonstrate mastery of fundamental knowledge and skills of chosen field*

## **IV. Process for Assessing Student Learning Outcomes**

Each of the learning objectives is discussed specifically below. Few of the objectives have specific measures to directly assess their efficacy. For example, none of the programs in the Department of Geosciences have exit exams. A national examination does exist for licensure as a Professional Geologist (ASBOG Fundamentals of Geology). Although this would provide data with national benchmarking, the exam is costly at \$200 per student and is focused on learning relevant to a career as a Professional Geologist, leaving many of our graduates with no exit exam recourse. Faculty discussed this as an option in 2007 and rejected it. No comparable national examination exists for geographers. However, specific skills in Geography (i.e. cartography) do require final maps and projects which mirror professional requirements for spatial data analysis, and map design, creation and production. Other data that would provide national benchmarking is performance of departmental degree recipients on the Graduate Record Examination, but that is not available to the Department unless the student willingly provides the information. Another option for assessment is student performance in a capstone course. The Geography BA, however, does not currently have a capstone course. The Geology BS has a capstone course (GEOS 4924 Earth Systems History), but the course also as capstone for the Earth Science BS, even though some prerequisites are not required for ERSCBS. Another measure may be performance in the required GEOS 4686 Geology Field Camp course typically taken close to the end of the undergraduate career. Although this may be an excellent indicator for those students with aptitude and future career plans that include field work, it may not reflect well upon those whose

interests and skills lie in other areas, such as laboratory or computer methods. The lack of appropriate capstone courses and exit exams clearly are weaknesses that should be remedied.

No placement exams are given upon entry into graduate programs and no exit exams (other than the oral defense of the thesis) are administered upon completion of graduate programs. Deficiencies are determined by comparison of undergraduate courses taken with those required by the relevant undergraduate program (e.g. BA Geography or BS Geology) at the University of Arkansas.

A discussion follows of each learning objective; goals are listed that will facilitate documentation of measurable outcomes in the future. The Department does, however, have indirect evidence with which to assess the achievement of learning objectives in the success of its graduates beyond the University of Arkansas. Student success will be summarized at the end of this section.

***Objective 1: Communicate Effectively Both Orally and in Writing***

*GEOGBA, GEOLBS, ERSCBS*

As a condition for graduation Fulbright College requires that all undergraduate students must present a research/analytical paper. The purpose of the upper-level writing requirement is to ensure that prior to graduation each student shall have demonstrated competency in research and writing by composing, under faculty supervision, a product that evidences qualities of basic scholarship, writing ability, and analysis. Syllabi of such courses within the Department of Geosciences suggest that writing is assigned throughout the curriculum. An independent assessment of writing and verbal skills is not conducted for all students in all courses, but is in specific upper level courses such as Earth Systems History, Political Geography, Urban Geography, Geography of Europe, Geography of the Middle East/North Africa, Geological Data Analysis, Geology Field Camp, Stratigraphy and Sedimentation, American Public Lands & Policy, Conservation of Natural Resources, among others. Those students in departmental honors must submit an original written paper and give an oral presentation on the research topic to their Honors committee including one at-large member assigned by Fulbright College. The oral presentation and honors thesis are given numerical scores and/or rankings. This provides an independent evaluation of written and oral communication skills that is otherwise difficult to obtain. Most professors assign examination questions requiring relatively thorough written responses or problem solving in courses above the 3000 level. Student performance on these exams is a quantifiable measure of their ability to articulate ideas presented throughout the curriculum.

*GEOGMS, GEOLMS*

Both degree programs require a thesis and its oral defense for graduation. One required course (GEOS 5612 Research methods in Geosciences) emphasizes technical writing and proposal

organization. Most graduate level courses require an independent project with a written report and in-class oral presentation. Some faculty hold weekly or monthly meetings for their graduate students requiring them to present progress on their work to the group or to their advisor. Graduate students in both degree programs are encouraged to present a seminar on their research. This may take the form of a talk at a regional or national meeting, such as those of the Geological Society of America, the American Association of Petroleum Geologists, the American Geophysical Union or the American Association of Geographers, a departmental colloquium, or a ‘brown bag’ presentation within the Department of Geosciences. The Graduate School routinely provides monies for students in PhD and Masters programs to attend one meeting per year, and Geosciences graduate students are taking full advantage of this opportunity. All graduate students within the Department of Geosciences are expected to attend the weekly departmental colloquium, which features distinguished speakers from across the spectrum of geoscience disciplines. Finally, graduate students on teaching assistantships teach laboratory sections or substitute for lecture sections periodically, gaining significant oral communication skill during the process.

### *GEOSPH*

Since the PhD is a research degree, students routinely present their work at departmental seminars, within research groups, at regional and national meetings, and generally present their work at least once in departmental colloquium. The PhD qualifying exam is a rigorous test of writing skills, and each student is expected to submit at least two publishable manuscripts before defending the dissertation.

#### Goals:

1. *Revise curricula to include earth science bs and geography ba capstone courses, which require original papers and technical oral presentations*
2. *Increase number of undergraduates participating in departmental honors and honors college curricula*
3. *Facilitate access to funds for graduate student travel to regional and national meetings*
4. *Develop funding resources to defer page charges for PhD student publications*
5. *Improve participation in departmental colloquium by graduate students*

### ***Objective 2: Organize and Analyze Information Quantitatively and Qualitatively***

#### *GEOGBA, GEOLBS, ERSCBS*

Content in every undergraduate course is designed to teach the analysis and synthesis of data and information. The Geology BS requires a 2000-level course called Geological Data analysis, added specifically to address quantitative analysis of large distributed data sets. Geography offers a similar course GEOS 4863 Quantitative Techniques in Geosciences with a slightly stronger emphasis on statistics. The Quantitative Analysis course is not required. All core

courses for the BS in Geology have associated laboratories that emphasize collection and interpretation of data (e.g. GEOS 1113 Physical Geology; GEOS 2313 Mineralogy; GEOS 3313 Igneous and Metamorphic Rocks; GEOS 3413 Sedimentary Rocks; GEOS 3514 Structural Geology; GEOS 4223 Stratigraphic Principles, GEOS 4643 Historical Geology, GEOS 4686 Geology Field Camp) and many for the BA in Geography (e.g. GEOS 4543 Geographic Information Systems, GEOS 3023 Introduction to Cartography, GEOS 4423 Advanced Cartography & Production, GEOS 4553 Introduction to Raster GIS). Other courses focus on the synthesis of information (i.e. semester-long papers that require library research such as GEOS 4783 Geography of Europe).

Goals:

1. *revise curricula to include capstone courses for GEOGBA and ERSCBS that require data analysis and synthesis*
2. *examine possibility of introducing exit exams and/or senior projects for all students*
3. *increase number of undergraduates participating in departmental honors*

#### *GEOGMS, GEOLMS*

MS students are required to take GEOS 5612 Research Methods in Geosciences with an emphasis on quantitative analysis, preparation of research proposals and presentations. The primary method with which to assess the ability of graduate students to organize and analyze information quantitatively and qualitatively remains the thesis. Students must defend the thesis in an open forum, which encourages external peer review and comment.

#### *GEOSPH*

The PhD degree often involves large data sets and significant analysis of that data. Where feasible, students are encouraged to work with open systems, data repositories, and principles of reproducible science.

Goals:

1. *Revise curricula to include capstone courses for GEOGBA and ERSCBS that require data analysis and synthesis*
2. *Increase number of undergraduates participating in departmental honors*
3. *Facilitate graduate level understanding, implementation, and creation of geo-spatial visualization and cartography across all degree programs*

#### ***Objective 3: Critical Thinking***

#### *ERSCBS, GEOGBA, GEOLBS*

Critical thinking is emphasized throughout the curricula through course assignments that include semester-long research papers and laboratory data synthesis (see syllabi). Field trips



also play an important role in encouraging students to examine natural examples of processes discussed in the classroom. Relatively small class size (<55 lower level, < 25 upper level, see Appendix C.4) promotes discussion-based learning and strong student-faculty interaction. Those students who participate in departmental honors are evaluated by the Honors Council of Fulbright College, which provides an independent means of student achievement.

### *GEOGMS, GEOLMS*

Critical thinking also is emphasized throughout the graduate curricula. Once again, small class size promotes strong student-faculty interaction, discussion-based learning, and student-driven choice of topic in 5000 level courses (see Appendix C.4). Student achievement in critical thinking is assessed by the student's thesis committee upon examination of the written thesis and the oral defense of the research. Our top MS students often have a co-authored paper in a peer-reviewed publication, but this is complicated by the tight MS timeline (2 years) in relation to the delay from submission to acceptance in a peer-review journal (several months to a year). That said, there are rapid publication venues that might be used in this situation assuming the journal quality is comparable.

### *GEOSPH*

Critical thinking is an essential component of the PhD degree. Comprehensive literature search and assimilation requires comparative analysis of the nature and quality of previous investigations. The ultimate evidence that a PhD candidate has attained a professional level of critical thinking is publication in peer-reviewed journals. Each PhD student in our department is expected to have submitted two publishable-quality manuscripts by the time of oral defense of the thesis. Top students often have more than two publications.

### Goals:

1. *Revise curricula to include ERSCBS and GEOGBA capstone courses that require critical thinking exercises*
2. *Increase number of undergraduates participating in departmental honors*
3. *Increase number of student publications in peer-reviewed journals*

### ***Objective 4: Appreciate Diversity***

#### *ALL PROGRAMS*

All undergraduate majors in Geography and Geology are required to complete the Fulbright College of Arts and Sciences core curriculum in partial fulfillment of the requirements for graduation. This curriculum is specifically designed to expose students to diverse ideas and cultures represented by Fulbright College academic units and to imbue students with an appreciation of the diversity of human social and cultural endeavors. In addition, the BA program in Geography by its very nature is one that incorporates cultural diversity at all levels. Introductory required courses are GEOS 1123: Human Geography, GEOS 2003: World and

Regional Geography. Elective courses run the gamut of global cultures and include GEOS 4033: Geography of the Middle East/North Africa, GEOS 4783: Geography of Europe, and GEOS 4233: Geography of Religion. The BS program in Geology is the most interdisciplinary among the natural sciences. Majors are required to take courses in allied sciences (chemistry, physics), and strongly encouraged to take elective coursework in biological sciences. Majors in the Earth Science BS program also take a number of courses in allied science fields. The BS programs in Geology and Earth Sciences also incorporate diversity, discussing the contributions of a diverse group of geologists to the discipline along with acknowledging and exploring the significance of geological structures to other cultures and populations through time. Furthermore, a number of GEOS courses explore principles of geosciences in the context of human dimensions, including GEOS 1133: Environmental Geology; GEOS 4043: Water Resource Issues; GEOS 3003: Conservation of Natural Resources; GEOS 4383: Hazard and Disaster Assessment, Mitigation, Risk and Policy; GEOS 4393: American Public Lands and Policy, GEOS 5153: Environmental Site Assessment; GEOS 3923H: Earth System Science; GEOS 5423: Remote Sensing of Natural Resources; and GEOS 3543: Geographic Information Systems. As such, curricula in geosciences are infused with courses emphasizing the broader impacts of geosciences on human society and culture. Even our regional offerings in Geography (i.e. Europe, Middle East, Asia) integrate physical, human, natural resource, political, and cultural landscapes.

In addition, inclusion of the Environmental Dynamics doctoral program (with its stated emphasis of research on human interactions within the environment) as an integral element of the geosciences program reinforces diversity concepts throughout the curriculum. Colloquia in Environmental Dynamics often focus on human dimensions of topics in geosciences. Thus, students see and experience diversity concepts from top-to-bottom of geoscience programs. All programs incorporate field trips both as part of regular course activities and as supplemental classes. GEOS 436V, for example, has a rotation of several locations that it visits, such that a student may venture to a different place for each of his or her four-year undergraduate experience. GEOS 4686 Geology Field Camp also takes students on a tour of the western U.S., exposing them to cultures from Kansas, Colorado, Wyoming, Montana, and the Dakotas. This is an ideal opportunity to teach students about other cultures who have lived in these areas and the significance of the geological features on the landscape to them. Other opportunities exist for students to travel as part of individual faculty research projects. During the past several years, for example, many students have conducted research in Petra, Jordan along with Tom Paradise. Others have traveled to Italy along with Fiona Davidson.

Boss has taken a lead role in diversity activities at the University of Arkansas initiating student recruitment via an educational partnership signed in the spring 2010 establishing a dual degree program with an Historically Black College in central Georgia, Fort Valley State University. Fort Valley has established dual degree programs with other Universities throughout the U.S.

including Penn State, the University of Texas-Austin, Georgia Tech, and the University of Nevada-Las Vegas. Under the dual-degree program the students earn a BS in Chemistry, Physics or Mathematics from Fort Valley State in a compressed three-year program. Students are then accepted into the partner institution where they earn a BS in geology or engineering in two years. In Geosciences we have added and matriculated four of the Fort Valley-Penn State graduates as MS candidates in Geology and were all hired by prominent oil companies at graduation. Cotangent, we established a strong working relationship with the National Association of Black Geoscientists (NABG), and through this link we have enrolled five geology masters students and one geography PhD student. Through the partnership with NSF Boss has been successful in securing funds to cover student expenses to the NABG for the last ten years and has also hosted the meeting here. Support of this conference is another way we can show our commitment to a more diverse geosciences workforce.

Through the Diversity and Inclusion plan created in 2019-2020 (Appendix E) we are increasing awareness of professionals in the geosciences that are not from majority backgrounds. We are also requiring our faculty and teaching assistants to take Bias Training and Diversity and Inclusion training. This will increase the intercultural competence of our faculty and staff and will help encourage all into a career in geosciences.

D. Stahle has active partnerships with faculty and students at several colleges and universities in Mexico via his NSF and NOAA funded research on reconstruction of climate based on tree ring proxies. This has fostered student-faculty interactions and hosting of international faculty here at UA.

T. Paradise has a 30-year research program in Petra, Jordan that has established a pipeline for international and local students to participate via the UA Middle East Studies program. In addition, from 2005-2010 and 2014-2018, Paradise was the Director of the King Fahd Center for Middle East Studies and Coordinator of Middle East Studies at the University where he oversaw related faculty and research, degree programs, and a substantial budget. This has helped expand diversity at UA from an international perspective. In addition, his television presence on the Smithsonian, NatGEO, PBS Nova, and Discovery Channels has increased our academic bridges between Jordan and the US.

Five of the Department's most recent faculty hires are international and one is a woman. Dr. Fangzhen Teng (left in 2012 for U. Washington), Dr. Xiangyang Xie (left in 2013 for Texas Christian), Dr. Xuan Shi (left for Georgia Tech), and Dr. Song Feng are Chinese. Dr. Mohamed Aly is Egyptian. In addition, Dr. Adriana Potra is a Romanian-Hungarian native, Katia Fernandes is a Brazilian native, and Dr. Celina Suarez is Latina-American. This exposes our students to a broader international and ethnically diverse cultural base.

One avenue that undergraduate majors in the Geosciences do not generally pursue is study abroad through the various options that Fulbright College provides. This may reflect the dearth of course offerings on overseas campuses that may be used to fulfill requirements for the various departmental majors or the lack of available funds to take advantage of such opportunities. However, increasingly our undergraduates are participating in the University's Rome Center programs where they are able to attend semester, or summer programs and coursework in the campus of 'Campo Marzo' in downtown Rome, Italy.

The graduate programs in Geosciences encourage students to engage in field research, much of which is done in locations outside northwest Arkansas. Current and recent graduates have worked in Canada, Mexico, Central America, Africa, Europe, the Caribbean, North Africa, and the Middle East, in addition to the US. Ability to conduct field research abroad frequently depends on availability of funding.

Goals:

1. *Implement department Diversity and Inclusion Plan*
2. *Increase study/research abroad opportunities for students and faculty, while not adversely affecting enrollment of our students in GEOS 4686 Geology Field Camp.*
3. *Strongly encourage graduate students to apply for international fellowships to support their field research*

***Objective 5: Know How to Use State-of-the-art Technology and Related Skills***

*All Programs*

The Department of Geosciences benefits from having access to the Center for Advanced Spatial Technologies (CAST), a research and service organization within the University of Arkansas. CAST focuses on applications of digital technologies to analyze Earth environments through time, including geographic information systems, computer cartography, geoinformatics, and remote sensing (see website: <http://www.cast.uark.edu>).

In the area of subsurface geological/geophysical analysis, IHS donated the PETRA software package, a suite of applications widely used in the petroleum industry, dramatically enhancing the quantitative and computing aspects of the BS and MS in Geology. Other petroleum-related software that have been donated include Schlumberger Petrel-TechLog-Eclipse (seismic, borehole and flow modeling), Kingdom suite (seismic data processing), Rose and Associates (risk and reserves), GeoTomo (seismic analysis), CGG HR10 (seismic inversion), Ikon Sciences RocDoc (seismic rock physics and inversion). We are also running groundwater modeling software and geochemical data processing software in the student accessible laboratories. These specialized software packages are in addition to the standard suite of GIS and remote sensing software installed on the machines and maintained by CAST technical

support. Hardware in the two primary computer laboratories is replaced every two to three years and the high-end specialized software is available in each.

Individual faculty members within the Department of Geosciences also have facilities as part of their research programs that are accessible to students who either are in their courses or engaged in supervised research at the undergraduate or graduate level. These include the Mass Spec Lab, the Arkansas Water Quality Laboratory, the Savoy Experimental Watershed, the Geophysical Data Processing Laboratory, the Tree-Ring Laboratory and the Earth Visualization Laboratory. In addition, in 2010, the Department created a dedicated Cartography Laboratory which accommodates 30 students, each with a desktop computer and related cartographic software (i.e. ESRI, Adobe, Surfer). The undergrad/graduate student use of the GEOS CartLab has dramatically increased their mapping capabilities who are now able to assist faculty in creating statistical and reference maps, in addition to their own coursework and research projects.

We note that in 2019 UA developed a new and fundamentally interdisciplinary BS Data Science program and students across all our degree programs are expected to benefit by course offerings, including concentration areas in various departments. GEOS/CAST will house the concentration in Geospatial Data Analytics. The goal of the Data Science degree is to prepare students for a successful career in data science with a solid amalgamation of capabilities:

- an ability to use information systems, statistics, and computer science principles and apply state-of-the-art technologies for data representation, data retrieval, data manipulation, data storage, data governance, data security, machine learning, computational analytics, and data analysis and visualization
- an ability to develop descriptive, predictive, and prescriptive mathematical and statistical models to provide abstractions of complex systems and organizational problems and to apply computational methods to draw conclusions supported by data
- an ability to use foundational knowledge and apply critical thinking skills to problem identification, problem solving, decision making, visualization, and societal and ethical impacts
- an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers
- an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another
- an ability to communicate in written, verbal, technical, and non-technical forms

Just as important as state-of-the-art software is appropriate data to be analyzed. Most graduate students generate some amount of data themselves, but others benefit from large data sets acquired by faculty, donated by alumni and industry, or purchased (e.g. dozens of large 3D

seismic surveys and related subsurface data from geological surveys of Australia and New Zealand)..

Goals:

1. *Maintain and expand modern software across all disciplines and encourage use in classes at all levels*
2. *Challenge students in all degree programs to embrace modern methods and software as well as data analysis as a core competency*

***Objective 6: Demonstrate Mastery of Fundamental Knowledge and Skills of Chosen Field***

Each curriculum follows a logical sequence of courses designed to introduce students to the fundamentals in each sub-area of the field. Specific skills and knowledge expected for each course are stated on the syllabi (Appendix A). Within each program, subject mastery will vary.

ERSCBS

For the Earth Science BS program, key skills include a comprehensive knowledge of the earth and atmosphere and how it has changed over time, ability to make and record observations in the field and analyze these data, effective oral and written communication, and demonstrate critical thinking in the scientific method applied to the earth/atmosphere system. Because the program has only minimum science requirements, it is expected that most students, particularly those that intend to continue in graduate studies, will use some of their elective credit hours to enhance their science backgrounds

GEOGBA

For students in the Geography BA program, important skills include familiarity with geographic regions and landscapes, geographic information systems (GIS), remotely sensed imagery, scientific data visualization, cartography, and statistics (basic to advanced). Knowledge should encompass the broad, spatial, and integrated themes of cultural, regional, and physical geography.

GEOLBS

For students in the Geology BS program, critical skills are the ability to create and interpret geologic maps and cross-sections, reconstruct geologic histories, and identify rocks and their constituent minerals. Knowledge should include understanding of surface and subsurface geologic processes and cycles, and the driving forces behind them.

GEOGMS, GEOLMS

The MS degree continues development of the BS skillset to levels required for advanced placement in industry or government career positions, or to a level sufficient for successful application to competitive PhD programs. Independent research ability is demonstrated by initiation and completion of the thesis project.

## GEOSPH

Doctoral candidates gain a broad perspective on Earth processes as well as a research specialization in a specific discipline within geosciences. Coursework and research specializes the student in one or more areas of geoscience (climate, GIScience, human geography, geology). Coursework provides the foundational theoretical knowledge, as well as the ability to carry out relevant field and laboratory techniques. Dissertation research designs an investigation, collects and analyzes collected data, forms interpretations and shares results with peers, faculty and members of the geoscience community in both oral and written formats. This program provides the specialized knowledge, critical thinking and communication skills necessary to succeed in a wide range of careers in colleges and universities, state and federal government research labs and private-sector industry.

### Goals:

1. *Monitor all degree programs with career alignment, fundamental knowledge, and required skills inventory*
2. *Gather feedback from External Advisory Board and selected alumni on program career alignment, fundamental knowledge, and skills inventory*

## V. Program Assessment

### A. Analysis of assessment of Student Learning Outcomes.

#### ERSCBS, GEOGBA, GEOLBS

Grade-point averages of students provide some information regarding their degree of mastery. Distributions of overall GPA for each undergraduate program are shown below. Less than 8% of GPAs in all programs are below 2.00, an improvement over the approximate 18% in the previous assessment period.

Frequency	Table of gpa_group by ua_primary_plan			
	ua_primary_plan(ua_primary_plan)			
	ERSCBS	GEOGBA	GEOLBS	Total
1.00-1.99	0	0	7	7
2.00-2.49	4	5	13	22
2.50-2.99	8	6	8	22
3.00-3.49	7	7	10	24
3.50-4.00	4	2	12	18
Total	23	20	50	93

Performance in capstone courses is another metric for assessing student learning as well as placement in graduate programs and success in the job market.

### *GEOGMS, GEOLMS*

The assumption with MS degree applicants is that students have the necessary skill sets and knowledge expected of undergraduates upon entry into the program. Deficiencies are identified on the basis of comparison of undergraduate curricula with that of the University of Arkansas. The additional mastery that is expected at the graduate-level depends primarily on the subject of the thesis. In a recent revision of the MS Geology degree we have reduced the number of required classes and introduced ‘interest tracks’ of suggested courses in select areas (e.g., petroleum, hydrogeology, geochemistry). Assessment is done using grades in courses, quality of the written papers and report, quality of thesis, and performance during the oral defense of the thesis. Graduates have been extremely successful in their fields. Appendix XI includes recent graduates and their current employment to the best of our knowledge. This is a very difficult metric to track as employment changes frequently and contact is often lost as a result.

### GEOSPH

Student learning outcomes are determined in the PhD case by presentation of original research at national and international conferences, publication in peer-review journals, participation in preparation of funding proposals, quality of the dissertation, and successful placement in the job market.

#### Goals:

1. Gather data on student initial placement after graduation for all degree programs
2. Maintain consultation with department External Advisory Board

## **B. Changes to Degree/Certificate Programs Made and Planned**

### **Program Changes Made**

#### GEOGBA

GEOS 4093 History and Philosophy of Geography and GEOS 5612 Research Methods in Geosciences have been revamped to create framework and context for undergraduate and graduate. Cartography/remote sensing GIS concentration information is [linked](#) here. Degree course details in Chapter VI.B below.

#### GEOLBS

In 2018 a complete review of the BS Geology degree was undertaken to conduct analysis of gaps and redundancies; identify outdated and extraneous courses; identify problems/weaknesses (e.g. discuss composite classes); evaluate potential changes and replacements; forward recommendations for consideration by faculty. Proposed curriculum status was presented to the



External Advisory Board during the November 2019 meeting for Board input. The semester plan given for GEOLBS in VI.B below is for the revised plan. Detail of changes:

1. Changed course number for GEOS 4873 Geological Data Analysis to GEOS 3873. Changed the prereqs MATH 2564 and GEOS 3514 to just a pre/corequisite of MATH 2564.
2. Changed title of GEOS 2313 Mineralogy and Petrology to Mineralogy. Eliminated “petrology” from the catalog description.
3. Changed title of GEOS 3313 Igneous and Metamorphic Rocks to Igneous and Metamorphic Petrology. Eliminated “petrology” from the catalog description. Added GEOS 3313 to the program requirements as an either/or with GEOS 4223 Stratigraphy and Sedimentation.
4. Changed GEOS 4873 Geological Data Analysis to GEOS 3873 and moved forward to spring of 2<sup>nd</sup> year. Moving the course to the 3000 level gives students the essential tools for data analysis and visualization early in the curriculum. Then they have the opportunity to solidify those skills in another 1-2 years of upper level geology courses.
5. Changed title of GEOS 3413 Sedimentary Rocks & Fossils to Sedimentary Geology. Eliminated “fossils” from the catalog description.
6. Changed title of GEOS 3114 Invertebrate Paleontology to Paleontology.
7. Added GEOS 3413 Sedimentary Geology and ‘GEOS 4223 Stratigraphy and Sedimentation or GEOS 3313 Igneous and Metamorphic Petrology’ as prerequisite for GEOS 4924 Earth System History.
8. Changed title of GEOS 1113 General Geology to Physical Geology. Also made GEOS 1111L the official corequisite and not just “recommended” since this follows University/state minimum core policy.
9. Removed GEOS 3383 Principles of Landscape Evolution from the program requirements and replaced it with GEOS 4053 Geomorphology. Course deletion proposal for GEOS 3383 submitted.
10. Edited catalog description for GEOS 4053 Geomorphology. Removed GEOS 3052 Geology for Engineers as a prerequisite and added GEOS 3873 Geological Data Analysis. Course deletion proposal for GEOS 3052 submitted.
11. Removed GEOS 1133/1131L Earth Science from the program requirements.

## GISTCP

The undergraduate Certificate of Proficiency in Geospatial Technologies (GISTCP) was launched in 2014 to respond to the growing need for trained practitioners with demonstrated geospatial skills. Years earlier, the US Department of Labor identified “geotechnology” as one of the three key emerging fields (Gewin, 2004) and consistently provided survey-driven data to support this initial projection through its career exploration platform (National Center for O\*NET Development, 2020). The certificate is designed for working professionals and for those who wish to join this field. The curriculum consists of six asynchronous online courses

incorporating a variety of video, text, notebook, collaboration, and version-controlled resources to enable students to interact with instructors and their peers in the study of geospatial technologies. The courses cover introductory geospatial applications and information science, math foundations for geospatial data analysis, Python and related geospatial programming concepts, spatial analysis using mainstream GIS platforms, geospatial data mining, and geodatabases. The certificate curriculum has been continuously updated since 2014 including adoption of recent GIS trends including online GIS, geospatial data science notebooks, and source control repositories.

## GEOLMS

Degree requirements were revised in 2018 to streamline required courses and recognize the widening field of geology developing in the department. Previously, requirements included three core courses in stratigraphy and sedimentation that were increasingly off-point for students in karst, hydrogeology, critical zone science, etc. GEOLMS changes were implemented and went into effect fall 2019. Modified passage of the degree requirements reads:

Requirements for the Master of Science Degree: The program in Geology requires 30 graduate course credit hours, six of which will be derived from a thesis reporting the results of an original research problem. All course work, a thesis topic, and the final thesis must be approved by the student's thesis committee. This committee is selected by the student and the student's thesis director and will consist of a minimum of three members. At least two of the committee members will be chosen from geology faculty whose areas of expertise coincide with the research interests of the student.

Each student will complete 30 credit hours that include 6 thesis credit hours and an additional 24 credit hours consisting of

- GEOS 5612 Geoscience Research Methods [fall]
- GEOS 5011 Colloquium [fall/spring]
- 12 credit hours of 5000-level courses (not to include unnamed special topic and independent study) taught by the Geology Faculty
- An additional 9 credit hours determined in consultation with the thesis Advisor and advisory committee.
- 6 credit hours of thesis

A listing of the Geology Faculty can be found in the Geosciences Graduate Student Handbook. Courses transferred or previously taken as an undergraduate may not be used for graduate credit toward the 24 credit-hour requirement. Students should be aware that courses taken to fulfill deficiencies as graduate students will incur graduate tuition. To complete the requirements for the degree, the candidate must complete all course work with a grade-point average of 3.00, submit an acceptable thesis, and pass a comprehensive examination based primarily on a defense of the student's thesis. Students should also be aware of Graduate School requirements with regard to [master's degrees](#).

## GISTGC

The Graduate Certificate in Geospatial Technologies (GISTGC) was launched in 2016 to provide a complementary curriculum for graduate students. Its curriculum includes all the same material as the GISTCP and additionally includes graduate student research and review activities to develop geospatial leadership capacity in commercial, government, and research settings. The GISTGC has similarly been updated annually in conjunction with the GISTCP. Special permission has been obtained from the Graduate School and International Education to host the GISTCP and GISTGC through combined graduate and undergraduate courses in our Blackboard learning management system, thus minimizing duplication during the ongoing curriculum update process.

## GEOSPH

Degree requirements were reviewed, updated, proposed and approved in 2019. Section VI.B below gives the revised requirements.

### **Program Changes Planned**

## ERSCBS

Early planning stage, alignment with careers, capstone course required. Concentrations – very early planning

## GEOGBA

Capstone course is needed for college and general education requirements; well defined concentration areas needed, particularly GIScience.

### **C. Any changes to the assessment process made or planned**

At this time no assessment process changes are planned.

## **VI. Curriculum**

### **A. Degree requirements, including general education requirements, institutional, college or school requirements, and major requirements.**

The State of Arkansas and university requires a degree minimum of 120 hours for the Bachelor's degree that must include ?

Additionally, students must have at least 40 hours of courses 3000 or higher and a total of at least 40 hours in their major area of study.

The state of Arkansas requires 6 general education goals to be satisfied for each BS degree plan.

1. Strengthen written, oral, and multimodal communication abilities [1.1,1.2]
2. Build core skills of quantitative literacy [2.1]
3. Develop a working knowledge of how scholars and artists think and act in fundamental areas of study [3.1,3.2,3.3,3.4]
4. Expand diversity awareness, intercultural competency, and global learning [4.1,4.2]
5. Demonstrate critical thinking and ethical reasoning [5.1]
6. Gain the ability to synthesize, integrate, and apply knowledge developed throughout the undergraduate years [6.1]

We are in the final stages of completing the general education alignment with degrees. Shown below are general education goal plans for ERSCBS, GEOGBA, and GEOLBS.

Department: Geosciences

Degree: Earth Science BS

<b>Outcome</b>	<b>Year/Semester Slot</b>	<b>Suggested Courses</b>
<b>1.1</b>	1/1 Required	ENGL 1013
<b>1.2</b>	1/2 Required	ENGL 1023
<b>2.1</b>	1/1 Required (1 of 5)	Math 1203 or other satisfying outcome and on plan
<b>3.1</b>	1/2 Core Fine Arts	MLIT 1003 or other satisfying outcome and core fine arts
<b>3.2</b>	2/2 Core Social Sci	ANTH 1033 or other satisfying outcome and core social sci
<b>3.3</b>	2/1 Core Social Sci	HIST 1113 or other satisfying outcome and core social science
<b>3.4</b>	1/1 Required	GEOS 1113
<b>4.1</b>	3/1 Core Social Sci	GEOS 2003 or other satisfying outcome and core social science
<b>4.2</b>	1/1 Core US History	HIST 2003 or other satisfying outcome and core US history
<b>5.1</b>	2/1 Core Social Sci	HDFS 1403 or other satisfying outcome and core social science
<b>6.1</b>	4/2 Required	We intend to modify the current GEOS 4924 so that it will meet the 6.1 requirements

Department: Geosciences

Degree: Geography BA

<b>Outcome</b>	<b>Year/Semester Slot</b>	<b>Suggested Courses</b>
<b>1.1</b>	1/1 Required	ENGL 1013
<b>1.2</b>	1/2 Required	ENGL 1023
<b>2.1</b>	1/1 Required	Math 1203
<b>3.1</b>	2/1 Core Fine Arts	MLIT 1003 or other satisfying outcome and core fine arts
<b>3.2</b>	1/2 Core Humanities	PHIL 2003 or other satisfying outcome and core humanities
<b>3.3</b>	2/1 Core Social Sci	HIST 1113 or other satisfying outcome and core social science
<b>3.4</b>	1/1 Required	GEOS 1113
<b>4.1</b>	2/1 Required	GEOS 2003
<b>4.2</b>	1/1 Required	GEOS 1123
<b>5.1</b>	1/1 Core Humanities	CLIST 1003 or other satisfying outcome and core humanities
<b>6.1</b>	4/2 Required	We intend to develop a capstone course that it will meet the 6.1 requirement

Department: Geosciences

Degree: Geology BS including geophysics concentration

<b>Outcome</b>	<b>Year/Semester Slot</b>	<b>Suggested Courses</b>
1.1	1/1 Required	ENGL 1013
1.2	3/1 General Elective	COMM 1313 or other satisfying outcome
2.1	3/2 General Elective	Math 1313 or other satisfying outcome
3.1	2/2 Core Fine Arts	MLIT 1003 or other satisfying outcome and core fine arts
3.2	3/1 Core Humanities	PHIL 2003 or other satisfying outcome and core humanities
3.3	2/2 Core Social Sci	HIST 1113 or other satisfying outcome and core social science
3.4	1/1 Required	GEOS 1113
4.1	2/1 Core Social Sci	GEOS 2003 or other satisfying outcome and core social science
4.2	2/1 Core US History	HIST 2003 or other satisfying outcome and core US history
5.1	3/1 Core Social Sci	HDFS 1403 or other satisfying outcome and core social science
6.1	4/2 Required	We intend to modify the current GEOS 4924 so that it will meet the 6.1 requirements

**B. Outline for each program curriculum, including the sequence of courses.**

**Earth Science BS**

First Year	Units	
	Fall	Spring
<u><a href="#">ENGL 1013</a></u> Composition I (ACTS Equivalency = ENGL 1013)	3	
Select one of the following:	3-4	
<u><a href="#">MATH 1203</a></u> College Algebra (ACTS Equivalency = MATH 1103)		
<u><a href="#">MATH 2043</a></u> Survey of Calculus (ACTS Equivalency = MATH 2203) <sup>1</sup>		
<u><a href="#">MATH 2053</a></u> Finite Mathematics <sup>1</sup>		
<u><a href="#">MATH 2183</a></u> Mathematical Reasoning in a Quantitative World <sup>1</sup>		
<u><a href="#">MATH 2554</a></u> Calculus I (ACTS Equivalency = MATH 2405) <sup>1</sup>		
<u><a href="#">GEOS 1113</a></u> General Geology (ACTS Equivalency = GEOL 1114 Lecture) & <u><a href="#">GEOS 1111L</a></u> General Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)	4	
1013 Elementary <u>ll</u> World Language Course (or higher level)	3	
University/State Core US History requirement	3	
<u><a href="#">ENGL 1023</a></u> Composition II (ACTS Equivalency = ENGL 1023)		3
Select one of the following MATH if still needed, else General Elective:		3-4
<u><a href="#">MATH 2043</a></u> Survey of Calculus (ACTS Equivalency = MATH 2203) <sup>1</sup>		
<u><a href="#">MATH 2053</a></u> Finite Mathematics <sup>1</sup>		
<u><a href="#">MATH 2183</a></u> Mathematical Reasoning in a Quantitative World <sup>1</sup>		
<u><a href="#">MATH 2554</a></u> Calculus I (ACTS Equivalency = MATH 2405) <sup>1</sup>		
General Elective		
<u><a href="#">GEOS 1133</a></u> Earth Science (ACTS Equivalency = GEOL 1124 Lecture) & <u><a href="#">GEOS 1131L</a></u> Earth Science Laboratory (ACTS Equivalency = GEOL 1124 Lab)		4
2003 Intermediate I World Language Course (or higher level)		3
University/State Core Fine Arts or Humanities Course requirement		3
Year Total:	16	16



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Second Year	Units	
	Fall	Spring
<u>GEOS 2313</u> Mineralogy and Petrology	3	
CHEM or PHYS Course (as needed)	4	
University/State Core Humanities or Fine Arts Course requirement (as needed)	3	
University/State Core Social Science requirement	3	
General Elective	3	
<u>ASTR 2003</u> Survey of the Universe (ACTS Equivalency = PHSC 1204 Lecture) & <u>ASTR 2001L</u> Survey of the Universe Laboratory (ACTS Equivalency = PHSC 1204 Lab)		4
<u>GEOS 3413</u> Sedimentary Rocks & Fossils		3
CHEM or PHYS Course (as needed)		4
University/State Core Social Science requirement		3
Year Total:	16	14

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Third Year	Units	
	Fall	Spring
BIOL Course (as needed)	4	
<a href="#">GEOS 3023</a> Introduction to Cartography <sup>1,2</sup>	3	
University/State Core Social Science requirement	3	
Advanced Level Elective <sup>1</sup>	3	
Advanced Level Elective <sup>1</sup>	3	
<a href="#">GEOS 3043</a> Sustaining Earth		3
BIOL Course (as needed)		4
Advanced Level Elective <sup>1</sup>		3
GEOS 4033 Hydrogeology (Sp)		3
General Elective		1
Year Total:	16	14

Fourth Year	Units	
	Fall	Spring
Select one of the following:	3	
<a href="#">GEOS 4353</a> Meteorology (as needed) <sup>1, 2</sup>		
or Advanced Level Elective <sup>1</sup>		
Upper Level GEOS Course <sup>1,2</sup>	3	
3000-plus Level Elective <sup>1</sup>	3	
General Electives	6	
<a href="#">GEOS 4924</a> Earth System History (ACTS Equivalency = PHSC 1104)		4
Select one of the following		3
<a href="#">GEOS 4363</a> Climatology		
or Advanced Level Elective <sup>1</sup>		
Upper Level GEOS Course <sup>1,2</sup>		3
3000-plus Level Elective <sup>1</sup>		3
Year Total:	15	13

**Total Units in Sequence:** 120

<sup>1</sup> Meets 40-hour advanced credit hour requirement. See [College Academic Regulations](#).

<sup>2</sup> Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See [College Academic Regulations](#).

## Geography BA

First Year	Units	
	Fall	Spring
<a href="#"><u>GEOS 1123</u></a> Human Geography (ACTS Equivalency = GEOG 1113)	3	
<a href="#"><u>ENGL 1013</u></a> Composition I (ACTS Equivalency = ENGL 1013)	3	
<a href="#"><u>MATH 1203</u></a> College Algebra (ACTS Equivalency = MATH 1103) (or any <a href="#"><u>higher level</u></a> math)	3	
1013 Elementary II World Language Course	3	
University/State Core Fine Arts, Humanities or U.S. History requirement	3	
<a href="#"><u>GEOS 1113</u></a> General Geology (ACTS Equivalency = GEOL 1114 Lecture) & <a href="#"><u>GEOS 1111L</u></a> General Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)		4
<a href="#"><u>ENGL 1023</u></a> Composition II (ACTS Equivalency = ENGL 1023)		3
2003 Intermediate I World Language Course (or higher)		3
University/State Core Humanities, U.S. History, or Fine Arts requirement (as needed)		3
General Elective		3
Year Total:	15	16
<b>Second Year</b>	<b>Units</b>	
	<b>Fall</b>	<b>Spring</b>
<a href="#"><u>GEOS 2003</u></a> World Regional Geography (ACTS Equivalency = GEOG 2103)	3	
<a href="#"><u>GEOS 1133</u></a> Earth Science (ACTS Equivalency = GEOL 1124 Lecture) & <a href="#"><u>GEOS 1131L</u></a> Earth Science Laboratory (ACTS Equivalency = GEOL 1124 Lab)	4	
University/State Core U.S. History, Fine Arts, or Humanities Course (as needed)	3	
University/State Core Social Science requirement (non-GEOS course)	3	
General Elective	3	
GEOS 3000 Level or Above Elective <sup>2</sup>		3
Advanced Level Elective <sup>1</sup>		3
General Electives		9
Year Total:	16	15

Third Year	Units	
	Fall	Spring
<b>GEOS 3023</b> Introduction to Cartography <sup>2</sup>	3	
GEOS 3000-level or Above Elective <sup>2</sup>	3	
General Electives	9	
<b>GEOS 3543</b> Geospatial Applications and Information Science		3
GEOS 3000-level or Above Elective <sup>2</sup>		3
Advanced Level Elective <sup>1</sup>		3
General Electives		6
Year Total:	15	15

Fourth Year	Units	
	Fall	Spring
GEOS 3000-level or above Elective <sup>2</sup>	3	
3000-plus Upper Level ARSC Elective with Departmental Consent <sup>2</sup>	3	
Advanced Level Elective <sup>1</sup>	3	
General Electives	6	
GEOS 3000-level or above Elective		3
3000-plus Upper Level ARSC Elective with Departmental Consent <sup>2</sup>		3
3000-plus Upper Level ARSC Elective <sup>2</sup>		3
3000-plus Upper Level Elective <sup>1</sup>		3
General Elective		1
Year Total:	15	13

**Total Units in Sequence:** 120

<sup>1</sup> Meets 40-hour advanced credit hour requirement. See [College Academic Regulations](#).

<sup>2</sup> Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See [College Academic Regulations](#).

## Geology BS

First Year	Units		
	Fall	Spring	Summer
<u>ENGL 1013</u> Composition I (ACTS Equivalency = ENGL 1013)	3		
<u>MATH 2554</u> Calculus I (ACTS Equivalency = MATH 2405) <sup>1</sup>	4		
<u>GEOS 1113</u> Physical Geology (ACTS Equivalency = GEOL 1114 Lecture) & <u>GEOS 1111L</u> Physical Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)	4		
<u>CHEM 1103</u> University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture) & <u>CHEM 1101L</u> University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab)	4		
<u>ENGL 1023</u> Composition II (ACTS Equivalency = ENGL 1023)		3	
<u>MATH 2564</u> Calculus II (ACTS Equivalency = MATH 2505) <sup>1</sup>		4	
<u>CHEM 1123</u> University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture) & <u>CHEM 1121L</u> University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)		4	
University/State Core Fine Arts or Humanities requirement		3	
Year Total:	15	14	

**Second Year**

	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
<b><u>GEOS 2313</u></b> Mineralogy <sup>1</sup>	3		
Select one of the following physic courses:	4		
<b><u>PHYS 2054</u></b> University Physics I (ACTS Equivalency = PHYS 2034)			
<b><u>PHYS 2013</u></b> College Physics I (ACTS Equivalency = PHYS 2014 Lecture) & <b><u>PHYS 2011L</u></b> College Physics I Laboratory (ACTS Equivalency = PHYS 2014 Lab)			
University/State Core US History Course	3		
University/State Core Social Science Requirement	3		
1013 Elementary II world language course (or higher, depending on placement)	3		
<b><u>GEOS 3413</u></b> Sedimentary Geology <sup>1,2</sup>		3	
Select one of the following physics courses:		4	
<b><u>PHYS 2074</u></b> University Physics II (ACTS Equivalency = PHYS 2044 Lecture)			
<b><u>PHYS 2033</u></b> College Physics II (ACTS Equivalency = PHYS 2024 Lecture) & <b><u>PHYS 2031L</u></b> College Physics II Laboratory (ACTS Equivalency = PHYS 2024 Lab)			
<b><u>GEOS 3873</u></b> Geological Data Analysis <sup>1</sup>		3	
University/State Core Social Science requirement		3	
2003 Intermediate I world language course (or higher level)		3	
Year Total:	16	16	

**Third Year**

	Fall	Spring	Summer
<u>GEOS 4223</u> Stratigraphy and Sedimentation or <u>GEOS 3313</u> Igneous and Metamorphic Petrology <sup>1,2</sup>	3		
University/State Core Humanities or Fine Arts requirement (as needed)	3		
University/State Core Social Science requirement	3		
General Elective	6		
<u>GEOS 3514</u> Structural Geology <sup>1,2</sup>		4	
General Elective		3	
<u>GEOS 4053</u> Geomorphology <sup>1,2</sup>		3	
General Elective		3	
<u>GEOS 4686</u> Geology Field Camp			6
Year Total:	15	13	6

**Fourth Year**

	Fall	Spring	Summer
<u>GEOS 4063</u> Principles of Geochemistry <sup>1,2</sup> or <u>GEOS 4663</u> Low-Temperature Geochemistry of Natural Waters or <u>GEOS 4433</u> Geophysics	3		
GEOS electives numbered 3000 or above <sup>1,2</sup>	6		
General Elective	3		
<u>GEOS 4924</u> Earth System History (ACTS Equivalency = PHSC 1104) <sup>1,2</sup>		4	
GEOS electives numbered 3000 or above <sup>1,2</sup>		3	
General Electives		6	
Year Total:	12	13	

**Total Units in Sequence:** 120

<sup>1</sup> Meets 40-hour advanced credit hour requirement. See [College Academic Regulations](#).

<sup>2</sup> Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See [College Academic Regulations](#).

Note: GEOS 3114-Paleontology, GEOS 4653-GIS Analysis and Modeling, and GEOS 4033-Hydrogeology are recommended GEOS Electives numbered 3000 or above.



**Geology BS with Geophysics Concentration**

First Year	Units		
	Fall	Spring	Summer
<a href="#"><u>ENGL 1013</u></a> Composition I (ACTS Equivalency = ENGL 1013)	3		
<a href="#"><u>MATH 2554</u></a> Calculus I (ACTS Equivalency = MATH 2405) <sup>1</sup>	4		
<a href="#"><u>PHYS 2054</u></a> University Physics I (ACTS Equivalency = PHYS 2034) <sup>1</sup>	4		
<a href="#"><u>CHEM 1103</u></a> University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture) & <a href="#"><u>CHEM 1101L</u></a> University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab)	4		
<a href="#"><u>ENGL 1023</u></a> Composition II (ACTS Equivalency = ENGL 1023)		3	
<a href="#"><u>PHYS 2074</u></a> University Physics II (ACTS Equivalency = PHYS 2044 Lecture) <sup>1</sup>		4	
<a href="#"><u>MATH 2564</u></a> Calculus II (ACTS Equivalency = MATH 2505) <sup>1</sup>		4	
<a href="#"><u>GEOS 1113</u></a> General Geology (ACTS Equivalency = GEOL 1114 Lecture) & <a href="#"><u>GEOS 1111L</u></a> General Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)		4	
Year Total:	15	15	
<b>Second Year</b>	<b>Units</b>		
	<b>Fall</b>	<b>Spring</b>	<b>Summer</b>
<a href="#"><u>PHYS 2094</u></a> University Physics III <sup>1</sup>	4		
<a href="#"><u>MATH 2584</u></a> Elementary Differential Equations <sup>1</sup>	4		
<a href="#"><u>CHEM 1123</u></a> University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture) & <a href="#"><u>CHEM 1121L</u></a> University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)	4		
<a href="#"><u>GEOS 2313</u></a> Mineralogy and Petrology	3		
<a href="#"><u>PHYS 3613</u></a> Modern Physics <sup>1,2</sup>		3	
<a href="#"><u>MATH 2574</u></a> Calculus III (ACTS Equivalency = MATH 2603) <sup>1</sup>		4	
<a href="#"><u>GEOS 3413</u></a> Sedimentary Rocks & Fossils <sup>1,2</sup>		3	
University Core Social Science Requirement		3	
General Elective		1	
Year Total:	15	14	



Third Year	Units		
	Fall	Spring	Summer
<a href="#">PHYS 3113</a> Analytical Mechanics <sup>1,2</sup>	3		
<a href="#">GEOS 4223</a> Stratigraphy and Sedimentation <sup>1,2</sup>	3		
<a href="#">GEOS 3383</a> Principles of Landscape Evolution <sup>1,2</sup>	3		
University Core History Requirement	3		
University Core Social Science Requirement	3		
<a href="#">GEOS 3514</a> Structural Geology <sup>1,2</sup>		4	
University Core Social Science Requirement		3	
General Electives		6	
<a href="#">GEOS 4686</a> Geology Field Camp			6
Year Total:	15	13	6

Fourth Year	Units		
	Fall	Spring	Summer
<a href="#">PHYS 4073</a> Introduction to Quantum Mechanics <sup>1,2</sup>	3		
<a href="#">GEOS 4433</a> Geophysics <sup>1,2</sup>	3		
University Core Humanities or Fine Arts Requirement (as needed)	3		
Electives	3		
<a href="#">PHYS 3453</a> Electromagnetic Theory I <sup>1,2</sup>		3	
<a href="#">PHYS 4991</a> Physics Senior Seminar <sup>1,2</sup>		1	
<a href="#">GEOS 4924</a> Earth System History (ACTS Equivalency = PHSC 1104) <sup>1,2</sup>		4	
University Core Fine Arts or Humanities Requirement (as needed)		3	
General Electives		4	
Year Total:	12	15	

**Total Units in Sequence:** **120**

<sup>1</sup> Meets 40-hour advanced credit hour requirement. See [College Academic Regulations](#). □

## Minor in Geography

Fifteen (15) hours in geography to include GEOS 1123. At least 6 hours must be numbered 3000 or above and must include one regional and one topical course. This minor is often used in tandem with BA/MA education degrees for teaching at elementary and secondary levels.

## Minor in Historic Preservation

This minor program was created to link Geography, Geology, Architecture, and Urban Planning undergraduates. Urban Geography, Cartography/GIS, Architectural/Urban planning, and Environmental coursework in the field of architectural and cultural heritage management. This interdisciplinary minor requires twenty-one (21) credits and has been successful in preparing Geosciences undergrads for further study or work in this emerging global industry and academic discipline. In addition, the Historic Preservation minor has been effective in facilitating the undergrad or graduate student semester or summer term at University of Arkansas Rome Center.

Requirements for a Minor in Historic Preservation: 18 hours from:

<b>ARCH 1003</b>	Basic Course in the Arts: Architecture Lecture (or equivalent class in architecture)	3-4
or <b>ARCH 1212</b> & <b>ARCH 1222</b>	Design Thinking I: Foundations in Technology and Design Thinking II: Foundations in History	
<b>GEOS 4073</b> or <b>LARC 3413</b>	Urban Geography History of Landscape Architecture I	3
<b>ANTH 4443</b>	Cultural Resource Management I (or equivalent class in cultural resources)	3
<b>GEOS 1133</b>	Earth Science (ACTS Equivalency = GEOL 1124 Lecture)	3
<b>GEOS 3023</b>	Introduction to Cartography (or equivalent class in spatial representation and visualization)	3
<b>GEOS 3033</b>	Building Materials Field Studies	3
<b>Total Hours</b>		<b>18</b>

**GEOS 3033** Building Materials Field Studies is the required field capstone course that will require two weekends (Saturday and Sunday) for completion. The course has been specifically designed for this program and will discuss the nature of building materials (wood, brick, mortar and stone), their identification and properties, weathering and erosion theory, assessment and mitigation (i.e. cleaning, consolidants, innovative trends). It is suggested that this class be taken last in the program series.

One semester participation in the University of Arkansas' Rome Program will substitute for six (6) credits from class requirements in Architectural History and Urban Studies listed above. A supplemental program internship is suggested in addition to the classes required if the student's career path is in Historic Preservation.

## Minor in Geology

**Requirements for a Minor in Geology:** A minor in geology shall be awarded upon completion of the following course work:

<b>GEOS 1113 &amp; GEOS 1111L</b>	General Geology (ACTS Equivalency = GEOL 1114 Lecture) and General Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)	2-4
or <b>GEOS 3052</b>	Geology for Engineers	
<b>GEOS 1133 &amp; GEOS 1131L</b>	Earth Science (ACTS Equivalency = GEOL 1124 Lecture) and Earth Science Laboratory (ACTS Equivalency = GEOL 1124 Lab)	4
<b>GEOS 2313</b>	Mineralogy and Petrology	3
Two GEOS Courses at the 3000-level		6
One GEOS Course at the 4000-level		3
<b>Total Hours</b>		<b>18- 20</b>

Students are advised to consult with a geology faculty member to develop the course work program that best complements their major area of study.

### **Geography BA with Cartography/Remote Sensing/GIS Concentration**

<b>Required Courses</b>		
<b>GEOS 3023</b>	Introduction to Cartography	<b>3</b>
<b>GEOS 3213</b>	Principles of Remote Sensing	<b>3</b>
<b>GEOS/ANTH 3543</b>	Geospatial Applications and Information Science	<b>3</b>
<b>Elective Courses</b>		
Select three of the following:		<b>9</b>
<b>GEOS 4523</b>	Cartographic Design and Production	
<b>GEOS 5423</b>	Remote Sensing of Natural Resources	
<b>GEOS/ANTH 4553</b>	Introduction to Raster GIS	
<b>GEOS/ANTH 4583</b>	Enterprise and Multiuser GIS	
<b>GEOS/ANTH 4593</b>	Introduction to Global Positioning Systems and Global Navigation Satellite Systems	
<b>STAT 4003</b>	Statistical Methods (or other approved statistics course)	
<b>CVEG 2053</b>	Surveying Systems (or other approved surveying course)	
<b>Total Hours</b>		<b>18</b>

**Undergraduate Certificate in Geospatial Technologies**

Requirements for a Geospatial Technologies Certificate: A total of 12-18 hours are required for the certificate.<sup>1</sup> Students must complete:

<b>GEOS 3013</b>	Foundations of Geospatial Data Analysis	3
<b>GEOS 3103</b>	Geospatial Technologies Computational Toolkit	3
<b>GEOS 3543</b>	Geospatial Applications and Information Science	3
<b>GEOS 3553</b>	Spatial Analysis Using ArcGIS	3
<b>GEOS 3563</b>	Geospatial Data Mining	3
<b>GEOS 3593</b>	Introduction to Geodatabases	3

<sup>1</sup> It is possible to waive 3 to 6 hours of required coursework for **GEOS 3013** and **GEOS 3103** through successful completion of proficiency exams.

### Geography MS

**Degree Requirements:** Requires a total of 30 semester hours. A minimum of 24 semester hours of coursework (including a 7-hour core and 6 hours of quantitative or computational electives), six semester hours of thesis, and a comprehensive examination (defense of thesis) conducted by the candidate's thesis committee are required for all students who obtain an M.S. in Geography.

<b>Core</b>		
<b>GEOS 5093</b>	History and Philosophy of Geography	<b>3</b>
GEOS 5333		3
<b>GEOS 5011</b>	Colloquium	<b>1</b>
<b>Quantitative and Computational Electives</b>		<b>6</b>
<b>GEOS 5043</b>	Foundations of Geospatial Data Analysis	
<b>GEOS 5083</b>	Geospatial Data Mining	
<b>GEOS 5513</b>	Introduction to GIS Programming	
<b>GEOS 5863</b>	Quantitative Techniques in Geosciences	
<b>GEOS 5033</b>	Advanced Vector Geographic Information Systems	
<b>GEOS 510V</b>	Special Problems in Physical Geosciences	
<b>ECON 4743</b>	Introduction to Econometrics	
<b>CSCE 4523</b>	Database Management Systems	
<b>CSCE 4613</b>	Artificial Intelligence	
<b>MATH 4153</b>	Mathematical Modeling	
<b>MATH 4503</b>	Differential Geometry	
<b>MATH 5213</b>	Advanced Calculus I (formerly MATH 4513)	
<b>MATH 5223</b>	Advanced Calculus II (formerly MATH 4523)	
<b>MATH 5383</b>	Numerical Analysis (formerly MATH 4363)	
<b>MATH 5393</b>	Numerical Linear Algebra (formerly MATH 4353)	
<b>STAT 4003</b>	Statistical Methods	
<b>STAT 5413</b>	Spatial Statistics	
Other courses as approved by a Department of Geosciences Chair-appointed committee.		
<b>GEOS 600V</b>	Master's Thesis	<b>6</b>

Students should also be aware of Graduate School requirements with regard to **master's degrees**.

## Geology MS

**Admission to Degree Program:** Students admitted to graduate study should have completed an undergraduate geology program similar to that required for the B.S. degree at the University of Arkansas. Applicants lacking an appropriate background may satisfy deficiencies while enrolled in Graduate School. Prospective students should submit application forms, three letters of recommendation, and a statement of their graduate and professional goals before January 15 for the fall semester and October 15 for the spring semester to assure their consideration. These dates are also deadlines for receipt of application for financial assistance.

**Requirements for the Master of Science Degree:** The program in Geology requires 30 graduate course credit hours, six of which will be derived from a thesis reporting the results of an original research problem. All course work, a thesis topic, and the final thesis must be approved by the student's thesis committee. This committee is selected by the student and the student's thesis director and will consist of a minimum of three members. At least two of the committee members will be chosen from geology faculty whose areas of expertise coincide with the research interests of the student.

Thesis		6
<b>GEOS 5612</b>	Research Methods in Geosciences	2
<b>GEOS 5011</b>	Colloquium	1
Electives at 5000 level		12
Taught by Geology faculty and not to include unnamed special topics and independent study.		
Additional Electives		9
To be determined in consultation with the thesis adviser and advisory committee.		
<b>Total Hours</b>		<b>30</b>

Courses transferred or previously taken as an undergraduate may not be used for graduate credit toward the 24-credit hour requirement. Students should be aware that courses taken to fulfill deficiencies as graduate students will incur graduate tuition.

To complete the requirements for the degree, the candidate must complete all course work with a grade-point average of 3.00, submit an acceptable thesis, and pass a comprehensive examination based primarily on a defense of the student's thesis.

Students should also be aware of Graduate School requirements with regard to master's degrees.



## Graduate Certificate in Geospatial Technologies

### Requirements for a Geospatial Technologies Graduate Certificate

Requirements for admission: Graduate status; there are no disciplinary requirements.

A total of 12-18 hours are required for the certificate:

<a href="#"><u>GEOS 5043</u></a>	Foundations of Geospatial Data Analysis	3
<a href="#"><u>GEOS 5073</u></a>	Geospatial Technologies Computational Toolkit	3
<a href="#"><u>GEOS 5083</u></a>	Geospatial Data Mining	3
<a href="#"><u>GEOS 5543</u></a>	Geospatial Applications and Information Science	3
<a href="#"><u>GEOS 5553</u></a>	Spatial Analysis Using ArcGIS	3
<a href="#"><u>GEOS 5593</u></a>	Introduction to Geodatabases	3

It is possible to waive 3 to 6 hours of required coursework for [GEOS 5043](#) and [GEOS 5073](#) through successful completion of proficiency exams.

## Geoscience PhD

Geosciences-specific requirements are intended to be in harmony with those of the Graduate Catalog admissions and requirements for PhD degrees as well as all other university-level requirements. Supplemental information can be found in Department of Geosciences Graduate Handbook. In case of conflict, university-level requirements prevail, followed by Geosciences program requirements found below. Exceptions to program requirements, in consultation with the advisor, must be approved by the Geosciences PhD coordinator and the department chair.

### Admission Requirements:

- Undergraduate and graduate GPA as well as GRE (Verbal, Quantitative, and Writing) will be reviewed on a competitive basis by the Geosciences PhD admissions committee
- Recommendations: Three (3) letters of recommendation from individuals qualified to assess the applicant's academic potential
- Acceptance by an advisor
- Current curriculum vitae
- Statement of academic and research interests
- Submit application by January 15th for Fall semester to assure consideration

### Degree Requirements:

- 24 course hours beyond the MS Geography, MS Geology, or an equivalent master's degree (or for those starting the program without a Master's, 48 course hours beyond a related Bachelor's degree)
- GEOS 5612 Research Methods in Geosciences



- GEOS 5011 Colloquium
- Two courses outside of the department that are supplementary to the student's interests and dissertation topic; these may be 3000-level undergraduate courses, if approved by the advisory committee and the Graduate School and International Education.
- No more than 3 course hours of special problems or independent study

The PhD degree is primarily a research degree, but communication of that research is critical for extension and application of research results as well as professional development; in order to advance communication skills, each student is required to teach labs and/or a course for at least one semester and/or to present scientific results at one or more national or international professional meetings. In addition, each student will present a departmental colloquium on the dissertation topic.

**Examination for Candidacy:** The candidacy exam should be taken within the first two years of graduate study and after completion 12 hours of graduate study, including Research Methods in Geosciences and Colloquium (see above). Two candidacy exams are administered by the advisory committee (consisting of the adviser plus 3-5 additional faculty members) during full-semester classes. The first exam is a review paper written using the format and length of a specified refereed journal. The committee will assign the paper topic and journal style, and the paper will be due 30 days later. The advisory committee will determine whether the quality of the review paper demonstrates sufficient preparation for independent dissertation research. The second candidacy exam is an oral defense of a written dissertation proposal. The format of the written dissertation proposal will be specified by the advisory committee. The defense must demonstrate to the advisory committee that the student is prepared to move to the independent dissertation-research stage. Upon successful admission to candidacy, the advisory committee is dissolved, and a dissertation committee (adviser plus 2-4 additional faculty members) may then be formed.

### **C. Outline the process for the introduction of new courses**

Each year the Curriculum committee and Chair meeting to review all courses under each degree plan to ensure the requirements and courses are in line with the desired goals and preparation for careers under each degree[JCK6] .

For a new course to be added to the catalog there generally is a temporary number used to teach the class first then this is switched to a permanent number once it has moved through the approval chain (which generally takes one year). Once the department has been decided the course should be assigned a permanent number and be added to the Course Catalog it will go through the following steps:

Submission of the course proposal is in fall semester, so the course has time to go through the approvals and be added to the following years Catalog of Study. All course additions (or inactivation/deletion) must be approved through the College and university-level approval steps:

1. Registrar Initial Review
2. Department Chair
3. <sup>+</sup>Global Campus
4. College Curriculum Committee
5. College Faculty
6. College Dean
7. Vice Chancellor for Academic Affairs
8. University Course and Programs Committee
9. <sup>\*</sup>Core Committee
10. <sup>~</sup>Graduate Committee
11. <sup>~</sup>Graduate Dean
12. Faculty Senate
13. Vice Chancellor for Academic Affairs
14. Registrar
15. Final Approval

<sup>+</sup>if online/off-campus delivery method is proposed

<sup>\*</sup>if change is proposed to core course

<sup>~</sup>if course is dual/graduate level (Further information can be found at

<https://registrar.uark.edu/courses-and-scheduling/course-changes.php>

#### D. Courses in degree programs currently offered by distance delivery

##### Courses offered online

Course Number	Course Title	Students this semester	Students per year	Year started	Requirement?
GEOS 1111L	Physical Geology Lab	38	80	2015	GEOSBS
GEOS 1113	Physical Geology	39	80	2015	GEOSBS
GEOS 1123	Human Geography	40	80	2016	GEOGBA
GEOS 2003	World Regional Geography	40	80	2017	GEOGBA
GEOS 3013/5043	Foundations of Geospatial Data Analysis	7	14	2014	GISTCP, GISTGC
GEOS 3103/5073	Geospatial Technologies Computational Toolkit	13	26	2014	GISTCP, GISTGC
GEOS/ANTH 3543/GEOS 5543	Geospatial Applications and Information Science	63	126	2014	GISTCP, GISTGC
GEOS 3553/GEOS5083	Spatial Analysis Using ArcGIS	8	16	2014	GISTCP, GISTGC
GEOS 3563/GEOS5083	Geospatial Data Mining	6	12	2014	GISTCP, GISTGC
GEOS 3593/GEOS 5593	Introduction to Geodatabases	4	8	2014	GISTCP, GISTGC

### **Plans to create new courses**

Urban Geography/Geography of Europe and Geography of the Middle East however there is a lack of faculty to move forward at this time.

There is a meeting to develop GEOS 3543 Geospatial Applications and Information Science during Spring 2020.

The Certificate of Proficiency in Geospatial Technologies (GISTCP) was launched in 2014 to respond to the growing need for trained practitioners with demonstrated geospatial skills. Years earlier, the US Department of Labor identified “geotechnology” as one of the three key emerging fields (Gewin 2004) and consistently provided survey-driven data to support this initial projection through its career exploration platform (National Center for O\*NET Development 2020). The certificate is designed for working professionals and for those who wish to join this field. The curriculum consists of six asynchronous online courses incorporating a variety of video, text, notebook, collaboration, and version-controlled resources to enable students to interact with instructors and their peers in the study of geospatial technologies. The courses cover introductory geospatial applications and information science, math foundations for geospatial data analysis, Python and related geospatial programming concepts, spatial analysis using mainstream GIS platforms, geospatial data mining, and geodatabases. The certificate curriculum has been continuously updated since 2014 including adoption of recent GIS trends including online GIS, geospatial data science notebooks, and source control repositories.

The Graduate Certificate in Geospatial Technologies (GISTGC) was launched in 2016 to provide a complementary curriculum for graduate students. Its curriculum includes all the same material as the GISTCP and additionally includes graduate student research and review activities to develop geospatial leadership capacity in commercial, government, and research settings. The GISTGC has similarly been updated annually in conjunction with the GISTCP. Special permission has been obtained from the Graduate School and International Education to host the GISTCP and GISTGC through combined graduate/undergraduate courses in our Blackboard learning management system, thus minimizing duplication during the ongoing curriculum update process.

# GIScience & Technology

## Two-year Plan – Fall 2018 to Spring 2020

COURSE	UNDERGRADUATE	GRADUATE	DELIVERY	FALL 2018	SPRING 2019	FALL 2019	SPRING 2020
Foundations of Geospatial Data Analysis*	GEOS 3013	GEOS 5043	online	Cothren	Cothren	Cothren	Cothren
Introduction to Cartography	GEOS 3023		campus	Paradise		Paradise	
Geospatial Technologies Computational Toolkit*	GEOS 3103	GEOS 5073	online	Tullis	Tullis	Tullis	Tullis
Geospatial Applications and Information Science*	GEOS/ANTH 3543	GEOS 5543	online	Limp	Limp	Tullis	Tullis
Spatial Analysis Using ArcGIS*	GEOS 3553	GEOS 5553	online	Limp	Limp	Aly	Aly
Geospatial Data Mining*	GEOS 3563	GEOS 5083	online	Cothren	Cothren	Cothren	Cothren
Introduction to Geodatabases*	GEOS 3593	GEOS 5593	online	Limp	Limp	Aly	Aly
GIS for Environmental Science	ENSC 3603		campus		Skinner		
Radar Remote Sensing	GEOS 4133	GEOS 5133	campus				Aly
Internship in GIS & Cartography	GEOS 440V	GEOS 550V	campus	x	x	x	x
Principles of Remote Sensing <small>(Approved at 3000-level for Fall 2019)</small>	GEOS 3213/4413	GEOS 5213	campus	Tullis		Tullis	
Introduction to Raster GIS	GEOS/ANTH 4553	GEOS 5453/ANTH 5553	campus	Kvamme		Kvamme	
Introduction to Global Positioning Systems and Global Navigation Satellite Systems	GEOS/ANTH 4593	GEOS 5293/ANTH 5593	campus	Limp			
Geospatial Unmanned Aircraft Systems	GEOS 4793/4793H	GEOS 5793	campus	Tullis		Tullis	
Operations Management of Unmanned Aircraft Systems		OMGT 5903	campus		Ham		Ham
Cartographic Design and Production	GEOS 4523	GEOS 5523	campus		Paradise		Paradise
Enterprise and Multiuser GIS <small>(New in Spring 2020)</small>	GEOS 4583	GEOS 5583	campus				Tullis
GIS Analysis and Modeling	GEOS/ANTH 4653	GEOS/ANTH 5653/ ENDY 5043	campus		Aly		
Quantitative Techniques in Geosciences/Quantitative Anthropology	GEOS/ANTH 4863	GEOS/ANTH 5863	campus		Kvamme		Cothren
Remote Sensing of Natural Resources		GEOS 5423	campus				Tullis
Seminar in Geoinformatics		GEOS 5973	campus		Tullis		Aly

### E. Instructor-to-student and student-to-student interaction for distance courses

Instructor-student interaction in the Certificate of Proficiency in Geospatial Technologies (GISTCP) and in the Graduate Certificate in Geospatial Technologies (GISTGC) varies from course to course.

For example, in Geospatial Technologies Computational Toolkit, this interaction is heavily facilitated through the Microsoft 365 OneNote class notebook extension in Blackboard. All course content is delivered as “handouts” via Microsoft OneNote, and each student then returns a

modified digital copy of the handouts using their individual “portfolio”. The instructor (or a graduate student TA if officially approved by the Graduate School and International Education in the case of undergraduate work) then provides comments and preliminary grade directly in OneNote where some identity and version control is maintained. The instructor then reviews all comments, provides any additional remarks, and posts the assignment grades in OneNote. This approach facilitates voice and video memos, virtually any type of attachments, multi user editing of Jupyter Notebook, Microsoft 365, and other documents, YouTube plugins, etc. Additional interaction in this class takes place through Zotero (for reference management) and University of Arkansas’ GitLab repository. A host of other methods are used in the various other GIScience and technology classes including the use of multi user enterprise geodatabases. Some classes also feature more traditional interactions through Blackboard such as pooled exam questions where some of the questions require instructor evaluation (cannot be auto graded). There is a strong variety of methods being used and these are heavily influenced by the GIScience and technology community.

With Human Geography and World Regional Geography there are no prerequisites (because they are survey courses) and no lab requirements. Exams are proctored through Proctor U and quizzes through the Respondus Lockdown browser. In terms of interaction, there is a weekly set of questions with instructor response; There are also eight (out of 15 weeks) of student/instructor discussion group responses to films that are selected for eight of the weekly lesson assignments. Films come from university licensed film sites (we used to use Kanopy but the library started dropping a lot of the films because of the \$150/year licensing fee).

## **VII. Program Resources**

### **A. Institutional support available for faculty development**

#### **Teaching**

#### **Teaching Grants**

The University of Arkansas supports annual competitive Teaching Grant competitions through the College-wide Fulbright College of Arts & Sciences *Teaching Support Program*, and campus-wide through its *Wally Cordes Center for Excellence in Teaching*. There two types of grants available each year: Teaching Innovation Travel Grants (up to \$2,500 each) and Student Success Grants (partnered with Global Campus distance learning, up to \$5,000 each). These grants are offered in order to fund activities to further enhance teaching excellence in support of the teaching mission at the University of Arkansas.

#### **New Faculty Orientation**

Each fall the University of Arkansas hosts *New Faculty Orientation*, where all new faculty are invited to attend a day-long session as an introduction to the University of Arkansas with breakaway sessions expanding on campus resources for teaching and curriculum innovation.

### **Faculty Lunch Series**

Each semester, two separate programs are offered that offer teaching seminars and visiting speakers with a focus on teaching innovations, techniques, and technologies. In addition, *The New Faculty Lunch Discussion* is focused on teaching assistants and teaching faculty with less than three years of experience. Such teaching-focused lunch discussions are provided four times during each semester, along with engaging and relevant topical programs. The *Not So New Faculty Lunch Discussions* are offered twice each semester and are designed for faculty with more than three years of teaching experience. Notification of each lunch topic and a reservation request is sent to all faculty prior to each program and have included such topics ‘Utilizing Blackboard in Video Discussions’, ‘Multi-media teaching’, ‘Linking Field and Classroom Experiences’.

### **Faculty Enrichment Series**

*The Faculty Enrichment Lecture Series* is offered in collaboration with the Office of the Vice Provost for Faculty Development and Enhancement and is open to all faculty at the University of Arkansas. The program topics vary but often involve technological and pedagogical interactions and implication in teaching. Two programs are offered each semester, in a variety of formats.

### **All Faculty Dead Day Events**

Our *All Faculty Dead Day Event* is a tradition at the University of Arkansas and is a campus-wide gathering of faculty for lunch with a wide-range of presentations including informal workshops, to formal visiting specialists on teaching. The Dead Day events occur during both the Fall and Spring semesters.

### **Winter Teaching Symposium**

The *Winter Teaching Symposium* is a half-day teaching symposium held between the Fall and Spring semesters and is considered by many faculty to be the official beginning of the Spring semester. Beginning with breakfast with remarks by campus administrators, a topical program is offered and followed by a variety of faculty-lead breakout sessions. Winter Teaching Symposium concludes with lunch, after which many faculty feel ready for the semester to begin.

### **Teaching Camp**

*Teaching Camp* is another faculty tradition offered each year during August before fall classes. Camp is an informal 3-day opportunity that focuses on one or more aspects of teaching in a

relaxed, offsite venue. The program and topics vary each year, but the objective of the program is to spend time reflecting on teaching, engaging with other teachers, and jumpstarting the academic year.

### **The Wally Cordes Teaching & Faculty Support Center**

The *Wally Cordes Teaching and Faculty Support Center* (TFSC) was established in 2016 to support faculty with questions, issues, and concerns regarding teaching at the University of Arkansas. Wally Cordes was a faculty member in the Department of Chemistry and Biochemistry for more than 30 years. He was regarded by many as simply one of the very best teachers on campus with a unique style and enthusiasm.

### **Wally Cordes Teaching & Faculty Support Center's 'Conversations'**

Through *Conversations with Colleagues*, the Wally Cordes Center continues the tradition of informal conversations meant to cultivate a community united in learning by honoring a different teaching faculty member on campus each month as the Wally Cordes Chairperson. The Wally Cordes Chairperson hosts an informal conversation about teaching and learning. This position travels the campus regularly but consistently brings together those dedicated to helping each other to improve student success at the University of Arkansas.

### **Teaching with Technology Workshop**

Each month, the University of Arkansas IT Services, Global Campus (Distance Learning), and Wally Cordes Teaching and Faculty Support Center offers a faculty-led lunch and workshop series on teaching with technology with a faculty member presenting the use of technology in the classroom followed by a discussion of its implementation and integration in the classroom. In addition to the workshop, there are Friday follow-up lunchtime sessions called '*Caffeinate Your Course*' in the Mullins Library, where interested faculty members may further the discussions regarding using technologies in their teaching.

### **Research**

The Office of Research & Innovation provides services to support the entire cycle of a research project from start to finish; offer multiple seed grants for faculty to stimulate interdisciplinary collaboration (Chancellor's Innovation Funds), biomedical research (ABI funds), industry engagement (industry partnership funds); provides travel grants for faculty to visit funding agencies and collaborators; offers workshops for faculty on writing successful proposals, forthcoming research funding opportunities, and research policy/compliance updates throughout the year.

**Core facilities** are centralized shared research resources that provide access to instruments, technologies, services, as well as expert consultation and other services to scientific and clinical investigators. Institutions establish core facilities, including the corresponding costing structure of the facility, to provide required services to users generally with all or a portion of the cost of these services charged to users' accounts. The typical core facility is a discrete unit within an institution and may have dedicated personnel, equipment, and space for operations. In general, core facilities recover their cost, or a portion of their cost, of providing service in the form of user fees. Core Facilities are entities authorized by the Office of the Vice Chancellor for Research and Innovation (VCRI) to generate revenue by providing fee-based services to the University of Arkansas (UA) research community, the Arkansas Research Technology Park (ARTP), as well as external customers. Core facilities include

- Arkansas High Performance Computing Center
- Arkansas Nano- Bio-Materials Characterization Facility
- Central Laboratory Animal Facility (CLAF)
- High Density Electronics Center
- National Center for Reliable Electric Power Transmission (NCREPT)
- Nuclear-magnetic Resonance Laboratory (NMR)
- Statewide Mass Spectrometry Facility

The **Office of Research Compliance (RSCP)**, a unit of the Office of Research & Innovation, is responsible for ensuring institutional compliance with federal and state regulatory requirements and University policies pertaining to sponsored and unsponsored research. RSCP staff will be happy to answer any questions you have pertaining to the regulatory oversight of research.

The University of Arkansas **Office of Sponsored Programs (OSP)** assists investigators with the process of finding funding sources, submitting proposals, and managing awards. OSP provides guidance to faculty and students in preparing proposals and expending awards in accordance with the regulations of federal and state governments and other funding agencies. OSP also provides general information regarding sponsored program activity at the University of Arkansas.

## Service

Service objectives for faculty

- *Serve in leadership positions in professional societies, on editorial boards of journals, and as reviewers/panelists for external funding agencies*
- *Support local, state, and regional objectives for geosciences*
- *Participate in department, college and university governance and committees*



The department chair makes committee assignments each summer for the upcoming academic year, with the exception of the Personnel Committee which is elected and ad hoc committees that can be assigned at any time. Current committee assignments and descriptions follow.

														<b>GEOS COMMITTEES 2019-2020</b>										
Aly, Mohamed	Boss, Stephen	Cheng, Linyin	Cothren, Jack	Covington, Matt	Davidson, Fiona	Dumond, Gregory	Feng, Song	Fernandes, Kátia	Hays, Phillip	Holland, Edward	Lamb, Andy	Limp, Fred	Liner, Christopher	Marshall, Jill	Paradise, Tom	Potra, Adriana	Sharman, Glenn	Sui, Dan	Shaw, John	Stahle, Dave	Suarez, Cellina	Tullis, Jason		
MA	SB	LC	JC	MC	FD	GD	SF	KF	PH	EH	AL	FL	CL	JM	TP	AP	GS	DS	JS	DS	CS	JT		
																						<b>Director/Coordinators/Advisors</b>		
																						GEOS Honors and Graduate Director		
																						BS Earth Sciences Advisor		
																						BA Geography Advisor		
																						BS Geology Advisor		
																						Geospatial Certificate Coordinator		
																						MS Geography Coordinator		
																						MS Geology Coordinator		
																						Geology Field Camp Coordinator		
																						Geoscience PhD Coordinator		
																						<b>Standing Committees</b>		
5	2	2			2											2							2	Personnel (elected) [2]
5			1				1							1		1				1	1			Geoscience PhD
5		1				1	1							1		1								Scholarship and Awards
5		1				1				1				1		1								Teaching Assistant Selection
5	1					1				1						1				1				Curriculum
6			1		1								1	1							1			Recruiting and Retention
0																								Diversity and Inclusion
																						<b>Ad hoc Committees</b>		
0				1					1					1						1				Faculty Search (Hydrogeology)
5	1		1											1		1							1	Faculty Search (GIScience)
3		1			1																	1		Diversity & Inclusion (+Kvamme,Hintz)
3	4	2	3	0	7	3	2	0	1	0	2	0	1	3	3	4	4	0	3	2	2	5		
																						Director		
																						Advisor/Coordinator		
																						Chair		
																						Member		
																						ex officio		

--- Director/Coordinators/Advisors ---

**GEOS Honors and Graduate Director:** Oversee all aspects of Honors and Graduate activity in the department. The Department Vice Chair inherits this position.

**BS Earth Sciences Advisor:** Refers routine course planning to [Fulbright advising center](#). For non-standard students (late transfer or degree switch), refer to other faculty or directly advise on course schedule to get back on plan and move to Fulbright advising.

**BA Geography Advisor:** Refers routine course planning to [Fulbright advising center](#). For non-standard students (late transfer or degree switch), refer to other geography faculty or directly advise on course schedule to get back on plan and move to Fulbright advising.

**BS Geology Advisor:** Refers routine course planning to [Fulbright advising center](#). For non-standard students (late transfer or degree switch), refer to other geology faculty or directly advise on course schedule to get back on plan and move to Fulbright advising.

**Geospatial Certificate Coordinator:** Reviews all Geospatial Certificate applicants and decides to admit/decline. Monitors progress of Certificate students.

**MS Geography Coordinator:** Reviews and ranks all MS Geography applicants and makes recommendation to Geosciences Chair to admit/decline. Assigns each admitted student to an initial faculty advisor that may, or may not, become the thesis advisor. Sits *ex officio* on Geography Teaching Assistant Selection Committee.

**MS Geology Coordinator:** Reviews and ranks all MS Geology applicants and makes recommendation to Geosciences Chair to admit/decline. Assigns each admitted student to an initial faculty advisor that may, or may not, become the thesis advisor. Sits *ex officio* on Geology Teaching Assistant Selection Committee. [1]

**Geology Field Camp Coordinator:** Oversee all aspects of preparation for GEOS 4686 Geology Field camp. This includes, but is not limited to, advertising, reviewing and approving student applications, selection of teaching assistants for field camp, ensuring field equipment (including vehicles) are maintained properly leading up to camp, field guide production, and safety plan. All of these activities are to be done cooperatively and by consensus with field camp faculty. Advise Department Chair on target enrollment and multi-year faculty coverage plan for field camp that ensures two-deep leadership at all times in the field. Coordinator may participate in field camp as swing faculty, but does not count toward the requirement of two-deep leadership. [1]

**Geoscience PhD Coordinator.** In coordination with individual advisors, monitors PhD Student progress. Serves as Chair of GEOS PhD Committee.

--- Standing Committees ---

**Personnel Committee:** Elected committee with staggered 2-year terms that reviews and submits recommendation to Geosciences Chair for faculty annual evaluation. Reviews and submits recommendation to Geosciences Chair concerning faculty tenure and promotion, and prepares statement for inclusion in faculty tenure/promotion package including the formal vote of the committee. Reviews tenure-track faculty third year portfolios, and submits written review and recommendation to Geosciences Chair. Works with candidates for tenure/promotion to identify potential external reviewers. (Personnel Committee also serves as the unit Peer-Review committee as allowed by UA Board Policy 1405.11, revised 13 April 2019, section III.3.C.1.

NB: when Personnel and Peer-Review committees are separate, Personnel does promotion and tenure while Peer-Review does annual reviews)

**Teaching Assistant Selection Committee:** Reviews and ranks all applicants for Teaching Assistantships in Geography and Geology. Makes recommendation to the Geosciences Chair which ones should receive an offer of Teaching Assistantship. Geography currently has 5 hard funded Teaching Assistantships plus one hard funded position dedicated to Computer Laboratory Maintenance. Geology currently has 12 hard funded MS Teaching Assistantships.

**Scholarship and Awards Committee:** Selects deserving/eligible students for receipt of scholarships/awards funded by University Foundation endowed scholarship accounts. Application deadline Jan 15.

Process and priorities:

1. The following get automatic scholarships
  - a. All GEOLBS students attending field camp
  - b. All GEOGMS TAs (always 6)
  - c. All GEOLMS TAs (always 12)
  - d. All GEOSPH TA without DDF/DAF (max 9)
2. Extra funds (if any) will be discussed by committee based on applications gathered via GoogleForm
3. External scholarships
  - a. Tulsa Geophysical Society scholarship must be for field camp so we put forward our best two GPA applicants from item 1.a and that money is given in addition to department scholarship as a reward for top academic performance
  - b. Other external scholarships based on application information, but not to any students in item 1

**Curriculum Committee:** Reviews curriculum and degree programs, and makes recommendation for modification/deletion/addition to Geosciences Chair and Faculty. Approves MS Geography quantitative and computational electives not in the [approved elective list](#).

**Geosciences PhD Committee:** Reviews and ranks all PhD Geoscience applicants and makes recommendations to Geosciences Chair which ones should be admitted and declined. Each admitted student must have a faculty advisor and financial support.

**Recruiting and Retention Committee:** Propose, plan and coordinate new initiatives and engage faculty in creating and participating in recruitment and retention activities.

## **B. Professional development of full-time program faculty**

The Department of Geosciences tenured/tenure-track faculty are research-active in national and international societies. Their research and conference presentations are supported through numerous national and international grants. The Department also supports staff members' growth with available funding for professional development opportunities.

Professional development opportunities for teaching are available through the University's Teaching and Faculty Support Center as well as the University's Teaching Academy. These monthly programs offer an opportunity for faculty to learn and engage with each other in the scholarship of teaching. The Teaching Academy is especially important. It includes faculty members recognized by their peers, colleges, and the university for excellence in teaching. It requires professors to demonstrate a special rapport with students, to instill a love for learning, and to encourage students to go beyond the expectations of the classroom and to explore the disciplines for themselves.

### **Chancellor and Provost Office**

The Office of Faculty Development and Enhancement works to create a supportive and encouraging environment for faculty members to grow professionally. In conjunction with the Teaching and Faculty Support Center and the Office for Research and Economic Development, the Office of Faculty Development and Enhancement is responsible for assisting faculty with their research and teaching commitments as well as work-life balance.

The Office of Faculty Development and Enhancement oversees the following programs:

- All Department Chairs Roundtable
  - The Council of Chairs is a 90-minute seminar held twice each semester. These seminars provide an opportunity to have conversations with department chairs from all over campus as well as participate in professional development workshops. Topics of discussion will be chosen based on relevant issues and challenges that department chairs face. In addition, each chair workshop will host the provost or other administrative officers for information/announcement updates and a Q & A.
- Chancellor's Academic Fellows
  - The Chancellor's Academic Fellows program is intended to assist mid-career and senior faculty who have an interest and/or talent in administration. It will allow faculty to explore senior administration without taking a break from their teaching and research.
- Chancellor's Bus Tour
  - The Chancellor's bus tour takes new faculty on a three-day tour of Arkansas each spring to visit schools, industry and communities to help them experience their state and see some of the hometowns of their students. The experience is intended

to inspire collaboration and outreach opportunities among faculty, enable valuable connections with people and communities and provide insight into the places that make Arkansas so unique.

- Chancellor's Creativity, Innovation, Collaboration Fund
  - Innovation & Collaboration Fund \$1M/yr
    - Provides seed funding to support bold interdisciplinary projects that have not received prior funding.
  - Commercialization Fund \$1M/yr
    - Provides funding for technologies with strong commercial potential
  - Gap Fund up to \$400K/yr
    - Supports faculty-led teams that are launching start-up companies.  
Applicants must have already completed the National I-Corps program.
- Daniel E. Ferritor Award
  - The annual Daniel E. Ferritor Award for Departmental Excellence in Teaching will be awarded to the department or academic unit on campus that best displays excellence in teaching. This department will receive \$10,000 and a trophy, as well as having the unit name placed on a university plaque housed in that department for a year. The Ferritor Award is co-sponsored by the Office of the Provost and the Teaching Academy.
- Preliminary Academic Chair Education
  - The purpose of Preliminary Academic Chair Education (PACE) is to equip new chairs to balance their administrative duties with their research or teaching commitments, and prepare them to handle a variety of issues they may face as the chair of an academic department.
- Provost's Collaborative Research Grants
  - Faculty who apply for this grant may receive up to \$5,000. Collaboration between two or more researchers is required to be considered with preference for anyone who applies for this grant. Recipients of the grants will be notified in mid-November, and will have until June 30, to use the awarded funds.  
Acknowledgement of funding on any published documentation related to the research and its findings will be required.
- Provost Faculty Enrichment Series
  - Throughout the academic year, the Office for Faculty Development and Enhancement, in conjunction with the Teaching and Faculty Support Center, hosts sessions on topics such as: technology in the classroom, work-life balance, student development, among many others.
- Provost's Instructional Enhancement Grant
  - The Provost's Instructional Enhancement Grant is intended to support full time faculty, including non-tenure-track, in activities that lead to professional growth

in teaching and learning. The purpose of the grant is to assist those with heavy teaching loads, in terms of number of courses and/or number of students.

- Research & Discovery Camp
  - The purpose of Research & Discovery Camp is to introduce faculty who are starting their research program to strategies and techniques that will make their research programs more successful. Participants will be introduced to research development and research compliance policies, procedures, and resources. This program is offered in conjunction with the Office of Research.
- Travel Assistance Program
  - As part of the Provost's commitment to supporting Faculty Development and Enhancement, any and all full-time faculty are eligible to receive travel assistance if they are presenting original research at a professional conference.

### **Human Resources**

University of Arkansas' Employee Development Program (EDP) is housed in Human Resources. They provide professional, management and leadership development, diversity training, soft skills training, technology skills, and more. EDP is committed to improving employees' work lives, departmental effectiveness, institutional productivity and success. EDP staff are always available to answer questions or help you find the perfect training. Faculty can view a list of all the Human Resources sponsored training you have attended by clicking on My Training and logging in with your Uark username and password. Upcoming training events are available on a calendar. To register for a workshop from the calendar view, click on the name of the workshop and click register.

### **OEOC**

The Office of Equal Opportunity and Compliance (OEOC) is responsible for providing educational training programs to assist members of the University community in understanding discrimination, harassment and retaliation, and how to address behaviors that violate University policy. Training and education are fundamental to maintaining an environment free from discriminatory harassment and retaliation. OEOC maintains information that explains in simple, understandable terms the University's policies and procedures concerning discrimination, harassment and retaliation, and will maintain copies of the brochures in its office and at other offices where persons are likely to seek counseling and advice regarding discrimination, harassment and retaliation. Managers, supervisors, faculty, deans, directors, and department heads are responsible for informing employees who are under their direction or supervision of the University's policies prohibiting discrimination, harassment and retaliation. OEOC Training Courses are valid SHRM Recertification courses. All employees are required to take certain oeo training courses. More information can be found on the [oec training portal](#). Certain required trainings are offered online, through our online learning partner, [everfi](#).

**C. Annual library budget for the program**

Below is our budget breakdown Geosciences from the last 5 years. We have five sub-fund codes that support GEOS and the numbers below represent the combined sum of these. The resources supported by these funds included both print and electronic resources.

	<b>FY13 Breakdo wn</b>	<b>FY14 Breakdo wn</b>	<b>FY15 Breakdo wn</b>	<b>FY16 Breakdo wn</b>	<b>FY17 Breakdo wn</b>	<b>FY18 Breakdo wn</b>	<b>FY19 Breakdo wn</b>	<b>FY20 Breakdo wn</b>
<b>Appropriated</b>	\$151,31 6.31	\$160,29 2.88	\$165,60 2.00	\$174,44 1.85	\$192,01 4.15	\$196,36 2.94	\$172,45 9.00	\$144,26 5.66
<b>Expensed</b>	\$150,78 0.61	\$158,38 6.63	\$166,73 1.92	\$174,44 1.85	\$187,65 6.83	\$175,59 5.53	\$150,65 7.93	N/A

The decrease in FY20 funding is a result of the Library having to cut expenses in our Serials budget. This occurred across all departments the Library serves. The monographs (books) budgets were not decreased and remained the same from FY19 to FY20.

The program does not have a library budget, but the University’s library resources (both on-site and electronic) are fully available to the faculty and students of the program. This includes a well-regarded and extensive interlibrary loan system. There are more than 200 databases, resources available in special collections, electronic and print journals and books, and a number of services available to faculty and students. A description of the resources available in our libraries may be found at <https://libraries.uark.edu/info/about.asp>

The Libraries collections contain access to both GeoRef and GeoScienceWorld databases as well as subscriptions to various high-impact geoscience journals. We have over 27,000 items housed specifically within the Geology and Geography collections (based on Library of Congress call number locations).

**D. Availability, adequacy, and accessibility of campus resources**

Budget categories include maintenance, teaching and laboratory enhancement funds (TELE), graduate assistants, salaries for tenured/tenure-track funding, and research incentive funds (RIF). The maintenance category is used for daily operation of the department and includes supplies, photocopying, telephone charges, shipping, and insurance premiums for the vans. The maintenance budget has changed from \$53,000 in fiscal year 2013 to \$44,500 in FY2020. The decrease is related to transition from wired phone lines paid by the department to centrally funded VOIP call systems implemented in 2019. This seems prophetic now in light of exclusive use of VOIP during the covid-19 situation.

TELE funds are used primarily to maintain departmental vans for field trips and to purchase equipment for teaching and laboratories, such as microscopes, glassware, and specialized software. TELE was \$53,000 for FY2006 and is \$72,00 for FY2020.

Research incentive funding (RIF) represents monies returned to the Department from research expenditures during the previous fiscal year. Forty percent of overhead costs are returned to the Fulbright College of Arts and Sciences of which half (20%) is disbursed to the departments. The Department of Geosciences then keeps half of what is disbursed from the Office of the Dean of Fulbright College (10%) and returns the remainder to the principal investigator whose award generated the overhead expense. RIF funding has increased steadily since 2014 as the large number of new junior faculty have become more grant productive.

FY14	\$13,333.21
FY15	\$18,890.91
FY16	\$20,016.86
FY17	\$24,947.35
FY18	\$28,175.04
FY19	\$40,436.83
FY20	\$44,234.42

Departmental RIF may be used for any research-related expense. Examples include colloquium speakers, equipment purchases, and faculty/student travel.

**E. Program equipment purchases for the past three years.**

Departmental equipment purchases (capital and non-capital) for fiscal years 2018-2010 total \$563,400 as detailed below.



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Acquired	Tag #	Eq. Code	Asset Description	Make	Model	Serial Number	Cost
7/1/17	2694515	CH	Digital Microscope Camera System	Leica	DMC4500		369304 32,197.73
			Super SPEC Handheld				
8/7/17	2694483	CH	SpectrometerSystem	Mount Sopris Instr	RS-230		16,365.10
8/9/17	2694482	CH	Terra Portable SRD Analyzer	Olympus	TER90011	TERRA566	78,296.50
9/5/17	2693929	CL	Laptop Computer	Dell	Latitude 5414	C51QSG2	2,721.12
9/7/17	2694236	CL	Desktop Computer	Dell	Precision T3420	1M1JMKX2	3,271.13
9/20/17	2693957	CL	HPX Hotplate	Saville	HPX-200	NOACCESS	3,988.53
10/18/17	2693922	CH	Digital Tritest 50 Load Frame	ELE International			188451794 11,451.23
10/18/17	2693958	CL	Alumina Ceramic Grinding Container	Spex SamplePrep		8505 NOSN	2,891.75
10/26/17	2693956	CH	Gemeni Table Assembly	Mineral Technologi	GT60 MK2		492 15,204.25
2/22/18	2695363	CH	Express Van	Chevrolet	Express 350	1GAZGNFG9J1212808	28,327.70
3/7/18	2695362	CH	Passanger Van	Chevrolet	Express 350	1GAZGNFG6J1210112	28,327.70
3/16/18	2695087	CH	Desktop Computer	Apple	Imac Pro	C02WD02HHXBF	7,577.79
4/6/18	2695163	CH	Desktop Computer	Apple	Imac Pro	C02VV0TEJL54	9,515.02
8/2/18	2696397	CH	Cephalopod Fossil Display Case	Flintco	128"x66"x27"	NONE	19,997.03
9/6/18	696006	CH	Pickup Truck	Ford	F250 XL	1FT7X2B6GKED40248	26,710.00
9/19/18	2695742	CH	Spectrofluorometer	Shimadzu	RF-5301PC	A401952037565A	18,208.27
10/10/18	2695829	CH	CG-6 Autograv Gravity Meter	Scintrex	CG-6		18090122 104,185.00
12/1/18	2696070	CH	Stereomicroscope	Leica	M125C		6036813 19,735.26
4/15/19	2696393	CL	Laptop Computer	Dell	Latitude 7490	20KZXT2	2,561.12
5/24/19	2696921	CL	Desktop Computer	Apple	Imac 27	D25YPOZGJV40	3,860.84
9/1/19	272107	CH	MagDrone R3	Sensys			43 12,049.38
9/4/19	271894	CL	Tower Workstation Computer	Dell	Precision 3630	9XH64Z2	3,259.15
9/4/19	271895	CL	Tower Workstation Computer	Dell	Precision 3630	9XH54Z2	3,259.15
9/26/19	271938	CL	Laptop Computer	Apple	MacBook Pro15	C02ZF4TWLVDQ	4,577.67
11/4/19	272420	CL	Desktop Computer	Apple	Imac 27	C02ZMOKJV3Y	2,511.08
12/13/19	272751	CH	Rock Display Case	Thos Moser	85-TBD		8,000.00
12/13/19	272752	CH	Rock Display Case	Thos Moser	85-TBD		8,000.00
12/13/19	272753	CH	Rock Display Case	Thos Moser	85-TBD		8,000.00
12/13/19	272754	CH	Rock Display Case	Thos Moser	85-TBD		8,000.00
12/13/19	272755	CH	Rock Display Case	Thos Moser	85-TBD		8,000.00
12/16/19	272756	CH	Albatross MAX UAV Kit	Applied Aeronautics		WILLUPDATE	7,650.01
<b>Total Capital Asset</b>							<b>508,699.51</b>

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7/1/17	7051570	NH	Computer	Dell	Latitude 3480	9GJ1NJ2	1,424.19
8/16/17	7051574	NH	Computer	Dell	Precision 5510	6GBPBH2	1,875.00
8/16/17	7051578	NH	Monitor	Dell	P2317H	CN03GJ21QDC0076SODEL	158.3
8/16/17	7051577	NH	Monitor	Dell	P2317H	CN03GJ21QDC0076SODFL	158.3
8/17/17	7051573	NH	Computer	Dell	Latitude 5580	28QPBH2	1,236.30
8/30/17	7051582	NH	Computer	Apple	A1706	C02V75KWHV2M	2,188.00
8/31/17	7031133	ND	Dell Ultra Sharp Computer Tower	Dell	1800fp	MX07R4774832337208UN	0
8/31/17	7031134	ND	Dell Monitor	Dell	1901fp	CN05Y2327161843RBBY5	0
9/1/17	7051590	NH	Monitor	Dell	P2417H	CN0KHONGQDC007812HDB	240.79
9/1/17	7051589	NH	Monitor	Dell	P2417H	CN0KHONGQDC007812HTB	240.79
9/5/17	7051583	NH	Computer	Dell	Latitude 5414 Ru	C51QSG2	2,479.38
9/7/17	7051594	NH	TabletComputer	Microsoft	Surface Pro	47125272453	2,022.90
10/13/17	7051652	NH	Computer	Apple	iMac 21.5"	C02VG0KB1G9	1,315.92
11/28/17	7051883	NH	Computer	Apple	iMac 21"	C02VX0ENJ1G9	1,358.00
12/1/17	7031162	ND	Monitor	HP	W2338H	CNC9160LK	0
12/1/17	7031161	ND	Monitor	Dell	REVA01	CN0UH83748220786035F	0
2/21/18	7031144	ND	Monitor	Dell	2001FP	CN0C06464663355N03VL	0
2/21/18	7031146	ND	monitor	dell	1903fp	CN07611671618A7P9	0
3/26/18	7051878	NH	Monitor	Dell	P2217	719RKK2	183.28
3/26/18	7051877	NH	Computer	Dell	Optiplex 7050	GNSZLN2	1,301.52
4/26/18	7051875	NH	Computer	Dell	Precision 5520	BMHXQN2	2,164.58
7/19/18			Film Scanner	Nikon	Super CoolScan 5000 ED		2,356.66
8/21/18	7061157	NH	Computer	Apple	iMacRet4K 21.5"	C02X80L0J1GC	2,159.88
9/5/18	7061237	NH	Computer	Apple	MacBook Pro 13"	C02XC5B6JHD2	2,401.33
10/16/18	7061202	NH	TV Streaming Device	Apple	TV 4K	C07X3CV2J1WF	179
10/16/18	7061203	NH	Computer	Apple	Macbook Pro 13"	FVFXCF2VHV29	1,449.00
1/9/19	7051111	ND	Monitor	dell	1703ft	CNO2V31571618488ACEL	0
1/16/19	7051113	ND	monitor	Optiquest	vs11201	Q5W062826355	0
2/8/19	7061311	NH	Tablet	Apple	iPad Pro 12.9"	DLXY32EWK822	1,299.00
3/27/19	7061364	NH	Computer	Dell	Latitude 7490	1BK6KWT2	2,122.00
5/24/19	7061567	NH	Monitor	LG	Ultrafine 5K	903NTEPD2820	1,169.95
7/1/19	7031147	NH	IPAD Air Gen 3	Apple	muuq2ll/a	DMPYB1W9LMPL	700
7/12/19			Magnetometer	Geometrics	G-857 Proton Magnetometer		2,136.00
7/12/19			Temperature Data Logger	Alpha Mach	T.rod.X		3,045.25
7/26/19	7061596	NH	Tablet	Apple	iPad Mini 256GB	DMPYC8YVLM9D	529
7/26/19	7061595	NH	Tablet	Apple	iPad Mini wifi64	DMPYT7TLLM93	379
8/15/19	7061735	NH	Monitor	Dell	P2219H	HDVV6W2	179.89
8/15/19	7061732	NH	Computer	Dell	Optiplex 7060	DR6CPY2	804.81
8/27/19	7051119	ND	monitor	Westinghouse	I2210nw	5520V81700212	0
9/4/19	7061684	NH	Computer	Apple	MacBook Pro 13"	C02Z9151LVDL	2,379.00
9/12/19	7061729	NH	Computer	Dell	Precision 3630	HMH4Z2	1,588.76
9/26/19	7061739	NH	Monitor	Dell	P2719HC	JXVZPS2	284.99
10/4/19	7061759	NH	Monitor	Dell	UltraSharp 27	8HHPPS2	397.49
10/24/19			Microscope	NCI	DM 500 Object Guide without Point Counting		1,048.00
11/20/19	7061809	NH	Tablet	Apple	iPad Pro 12.9"	DLXZM0Z0K824	1,628.00
12/2/19	7061813	NH	Tablet	Microsoft	Surface Pro 7	60585493853	1,647.99
1/9/20			Camera	Canon	Canon EOS RP Mirrorless Digital		1,103.90
1/15/20	7061831	NH	Computer	Dell	Optiplex 9010	8MHMFX1	1,000.00
1/16/20	7061872	NH	Computer	Dell	Latitude 7400	J63KL13	1,300.93
2/3/20	7061893	NH	Computer	Apple	MacBook Air 13"	FVFC1407LYWM	1,516.75
2/25/20	7061933	NH	Monitor	Dell	P2419HC	FTWLDZ2	207.11
2/25/20	7061934	NH	Computer	Dell	Optiplex 7070	G6PYX23	1,348.61
<b>Total Non-Capital Asset</b>							<b>54,709.55</b>

## VIII. Instruction via Distance Technology

### A. Institutional policies on the establishment, organization, funding, and management of distance courses/degrees

An academic department intending to propose new distance programs are required to identify the program's anticipated costs, funding sources, demand, and need for library resources, and to present plans to address the increased workload. The proposal needs to be approved by Vice Provost for Distance Education, Academic College, University Course and Programs Committee,

Graduate Council (if at the graduate level), Faculty Senate, Provost, Board of Trustees, and Arkansas Department of Higher Education. Change requests for existing distance courses and programs follow similar approval processes. Global Campus assists programs during the conceptualization, market research, and planning stage. Once programs are approved, it provides start-up capital and course development funds as well as in-kind support by Global Campus's instructional designers, academic technologists, and marketing and recruitment teams. Global Campus also supports compliance with interstate regulatory requirements. All distance courses are certified to be complete only when they meet appropriate quality standards.

On 16 Mar 2020 the entire University of Arkansas transferred to remote course delivery due to the outbreak of covid-19. Faculty were notified at the beginning of the week that there was a possibility of going remote by March 16<sup>th</sup> and most probably after the spring break on March 30<sup>th</sup>. Later in the week classes were suspended on March 12<sup>th</sup> and resumed on line beginning March 16<sup>th</sup>. The one and one half day break was to give faculty time to adjust to the new normal and to make resources available for faculty and teaching assistants to creating online content. This transition was accomplished and the semester was completed without major incident. Outstanding effort and smart response by faculty and students, plus strong support from Fulbright College dean was instrumental in this accomplishment.

## **B. Policies and procedures to keep the technology infrastructure current.**

IT Services maintains the technology infrastructure to ensure the security and compatibility of enterprise systems as guided by the [Computer and Network Security Policy](#), [Data Management Use and Protection Policy](#), and [Acquisition of Enterprise Systems Policy](#). The [Computer Activities Council](#) (CAC), the information technology governance structure at the University, facilitates participation of students, faculty, staff, and administrators in long-range planning and setting of priorities for IT Services.

Updates to applications (learning management system, video conferencing software, web conferencing software, etc.) are reviewed by application administrators and stakeholder representatives on a regular basis to ensure continuity of operation, security, and high levels of performance and support.

The Global Campus Instructional Design and Support Services team, along with the IT Services Director of Academic Technology and Innovation, work with faculty to identify, evaluate, pilot, and deploy emerging technology solutions that will enhance teaching and learning.

## **C. Procedures that assure the security of personal information.**

Procedures are in accordance with the [Computer and Network Security Policy](#), [Code of Computing Practices](#), and [Privacy Policy](#). The IT Security group monitors university systems and performs security audits of resources. IT Services also provides security services such as security information, anti-virus software, and security alerts.

University systems (student information system, learning management system, etc.) require authentication. Privileged supervisory accounts are limited and managed by system administrators.

Users must agree to the Code of Computing Practices and take a security quiz when setting up their UARK accounts. Users agree to comply with security mechanisms and to keep login credentials private.

Links to the [privacy policies of third-party tools used in online instruction](#) are provided in the information section of online courses and support sites.

#### **D. Support services that will be provided to students enrolled in distance technology courses/programs**

1. *Advising*: Each online program has an academic adviser in their prospective college assigned to students. Academic advising is an active, ongoing partnership between the advisors and students grounded in teaching and learning. Advising is based on students gaining accurate and appropriate information and direction to help make their educational experience relevant, coherent, and meaningful. It is a process that assists students in connecting with the University of Arkansas, making thoughtful decisions related to their academic experiences, and maximizing their educational and career opportunities.
2. *Course registration*: Students may add/drop classes online using the student information system. Students enrolled in online programs are given priority registration dates.
3. *Financial aid*: Financial aid instructions and resources (financial aid programs, cost of attendance information, and links to other aid providers) are available at <https://finaid.uark.edu/>. The website also contains Financial Aid TV, a library of videos with financial aid answers. Students can email [finaid@uark.edu](mailto:finaid@uark.edu) or call 479-575-3806. Financial aid counselors are available for all students. The [W.E. Manning Memorial Scholarship](#) is an annual award of \$2,000 per person for students in online degree programs. To be considered for the award, students enrolled in an undergraduate or graduate online degree programs must complete the scholarship application and essay. Students must demonstrate financial need, academic merit or significant community service. Preference will be given to first-generation higher education seekers and Arkansas residents.
4. *Course withdrawal*: Tuition and fees are cancelled at 100% for classes dropped on or before the last day to add class for the current term providing the student remains

enrolled in classes for the semester. In most cases, students may add or drop courses using UAConnect, the student information system. Students enrolled in self-paced online (correspondence) courses must contact the Office of Credit Studies via email from the student's UARK account. There is a pro-rata refund method used for students who withdraw from all university classes. Tuition and fee adjustment dates are determined by the Treasurer's Office. All fee adjustments dates are published on the academic semester calendar.

5. Distance education students can withdraw from all classes on the student registration system or notify the Office of the Registrar in writing.
6. *E-mail account*: All students are provided with a UARK email. [Office 365 Outlook](#) is the official email and calendaring service for students, faculty and staff. Check your email on the web with Outlook Online or using the Outlook app. Learn more about [student email accounts](#).
7. *Access to library resources*: Distance Education students have full access to library resources. In addition to the subject librarian, there is a librarian dedicated to distance programs and courses. A [Distance Learning Library](#) page serves as a portal for distance education students with video tutorials on how to use the resources and troubleshooting tips for accessing materials off-campus. The Interlibrary Loan Department will deliver library materials to University of Arkansas students, faculty, and staff who participate in courses either online or in a location other than the Fayetteville campus. Distance students who are also Arkansas residents may participate in ARKLink, a reciprocal borrowing program with other participating academic libraries in Arkansas.
8. *Help Desk*: [Help Desk](#) support is available via phone (479-575-HELP), chat, and a web portal at [help.uark.edu](http://help.uark.edu). Technical support is available online or by phone:
  - Monday-Thursday: 7am-midnight
  - Friday: 7am-5pm
  - Saturday: 11am-4pm
  - Sunday: 3pm-midnight
9. Help Desk agents provide support for student information systems, learning technology tools, university-supported software, and general computing. The Help Desk phone is answered 24/7 for outage reports.

#### **E. Technology support services that will be provided to students enrolled in distance technology courses/programs**

Distance students are provided with a UARK account that gives access to the following technology services:

1. UARK Email

2. UAConnect - campus wide student information system, used for class enrollment, rosters, grades, financial aid, tuition payments and more. All distance students are enrolled in an online tutorial and can contact Help Desk for support.
3. Blackboard Learn - learning management system. All distance students are enrolled in an online tutorial and can contact Help Desk for technical support.
4. Software – students have access to Office 365, antivirus, and other software free of charge or at reduced prices
5. Lynda.com – students have free, unlimited access to this online library of high-quality instructional videos on software tools and skills.
6. Box cloud storage
7. Hardware – The University of Arkansas Computer Store offers Dell and Mac computers at reduced rates, along with software and accessories. Distance students can order through the Computer Store website and purchases will be shipped to the student’s home.
8. ProctorU – The University of Arkansas partners with ProctorU for online test proctoring services for some online exams. During exam sessions, test takers must provide a photo identification and answer identity authentication questions generated from Test takers connect to a proctor via webcam, and the proctor uses screen-sharing software to close out of any programs the test taker is not allowed to use. The proctor will guide the test taker through providing evidence of a secure testing environment using the webcam. The proctor will observe the test taker using the webcam and monitor the test taker’s screen throughout the entirety of the examination.

**F. Orientation for students enrolled in distance technology courses/programs.**

A convenient [one-stop website](#) has been developed to provide information to online students. This site contains information regarding technology support services, academic integrity, financial aid, catalog of studies, when to register, and many more topics of importance. A more guided [orientation website](#) is available for online undergraduate students.

All distance students are enrolled in an online student tutorial in the learning management system. The course provides tutorials for UARK student information systems, and tutorials and practice activities for the learning management system. The course also has information about contacting Help Desk, Center for Learning and Student Success, Center for Educational Access, Counseling and Psychological Services, Registrar, Financial Aid, and the Career Development Center. The tutorial course is available to students as long as they are enrolled in courses.

**G. Institutional policy for faculty course load, number of credit hours taught, compensation, and ownership of intellectual property.**

Distance programs and courses follow the institutional policy for [faculty course load and number of credit hours taught](#), [compensation](#), and [ownership of intellectual property](#), and [copyright and distance learning](#).

Faculty are generally responsible for teaching, research, and service activities as well as professional development. A typical work assignment of a full-time faculty member is twelve work units (contact and preparation time for one credit hour) per semester, which is a 2-2 teaching load. We maintain a flexible 2-2 through application of a series of rules for TT faculty

1. Research funding buyout of one course is 10% of base salary
2. Large enrollment courses (>100) -- double teaching credit
3. One three-week session of GEOS 4686 Geology Field Camp – double teaching credit
4. One course relief for
  - a. MS Geology Coordinator
  - b. PhD Coordinator
  - c. Field Camp Coordinator
  - d. Under consideration is double credit for upper level courses with lab (as done in biology and physics)

Work assignments include teaching, research/scholarly/creative activities, and service or administration in varying proportions.

Generally, copyright ownership for technology enhanced course materials created jointly by faculty authors and by those whose contributions would be works made for hire will be jointly owned by the faculty authors and the University.

## **IX. Program Information**

### **A. Program enrollment history**

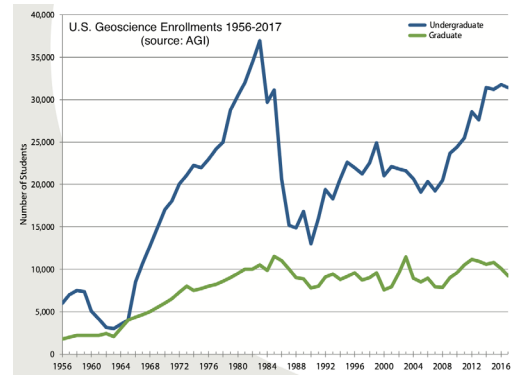
Using data from the Spring semester each year, the undergraduate majors by degree program are listed below for the period 2013-2020 (since last report), and 10-year history plots are shown further below.

Some general trends in our enrollment data seem to be

1. A strong driver is oil industry trends, in the time frame of the plots the oil/gas price crash of 2016 has resulted in lower enrollments to present. This is most strongly seen in the Geology BS and MS enrollment.
2. Earth Science BS is our most rapidly growing undergraduate degree program.

3. The Geoscience PhD has shown strong, steady growth since inception in 2012. Particularly notable is our current 20 PhD students in light of just 9 hard funded GA lines.
4. Geology field camp suffered in 2016 when out of state tuition was applied for the first time to non-UA students. With assistance from the Chancellor, this was reversed in 2017 but enrollment has not recovered. This is partly due to the ongoing oil/gas decline, and perhaps due to our traditional field camp source schools finding other suppliers when we raised tuition.
5. Female student representation has improved over the last decade and now stands at nearly 40% of the departmental student body.
6. Under-represented group students have improved over the last decade to stand currently above 30%, although the latest enrollment declines may have disproportionately impacted this group.

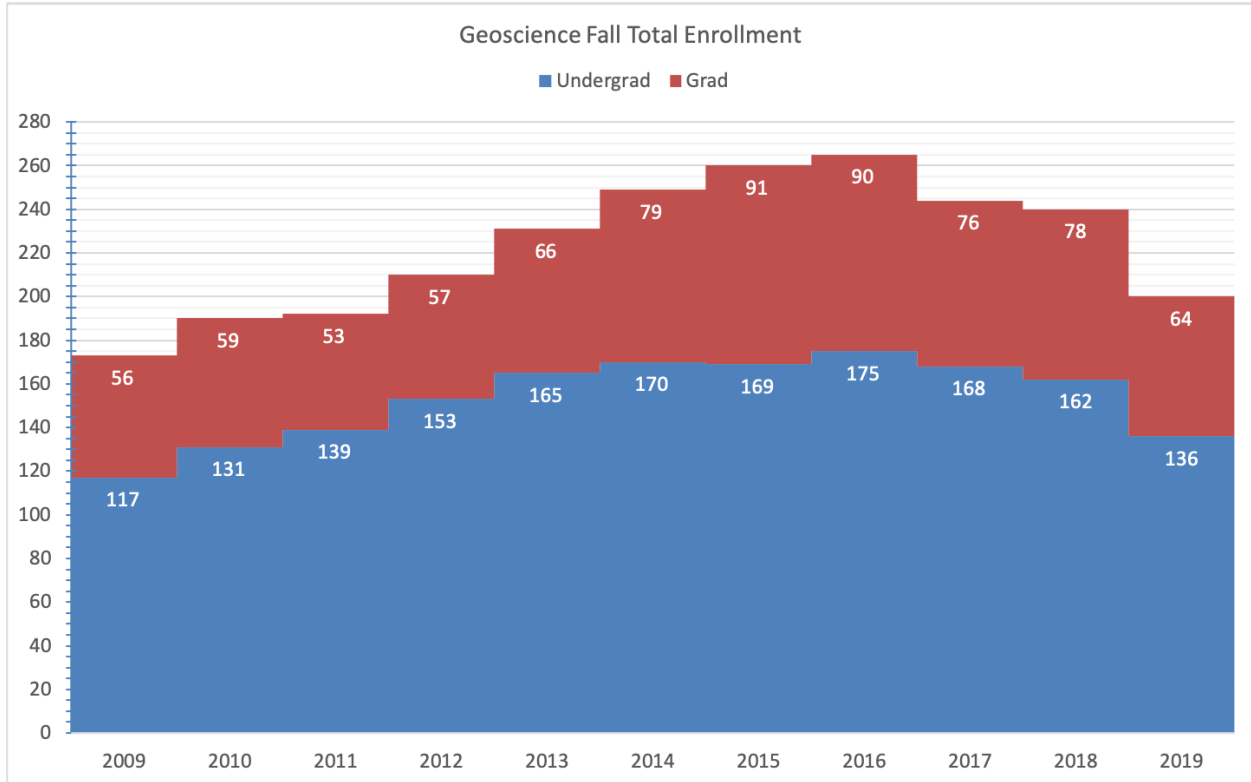
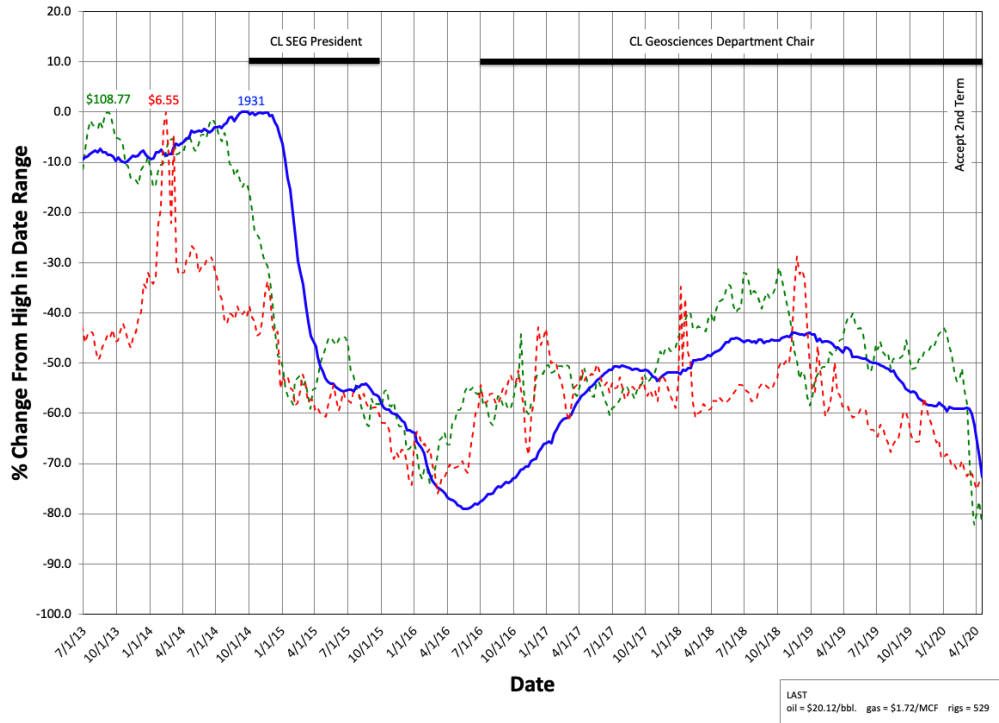
The graphs below give a visual 10-year history of enrollment in the department. Generally we can say that after several years of growth, both undergraduate and graduate enrollment peaked in 2016. But we note that geoscience departments nationwide have experienced enrollment declines similar to ours (plot right). This is believed to be due to a sustained downturn in fossil fuel commodity prices and business environment as detailed in the first graph below. Over the last decade the department has broadened substantially from our traditional geology relationship with oil and gas. This together with the entire geography side of the department has worked as a buffer to moderate enrollment decline.



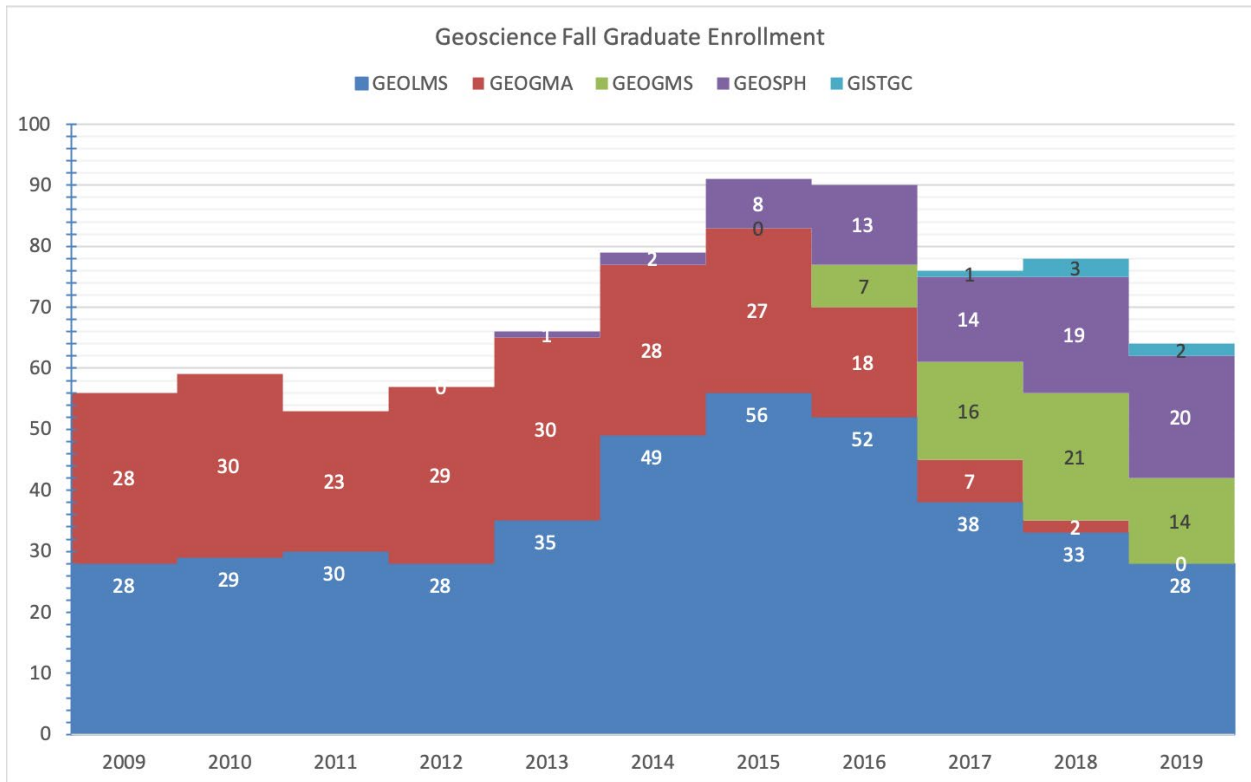
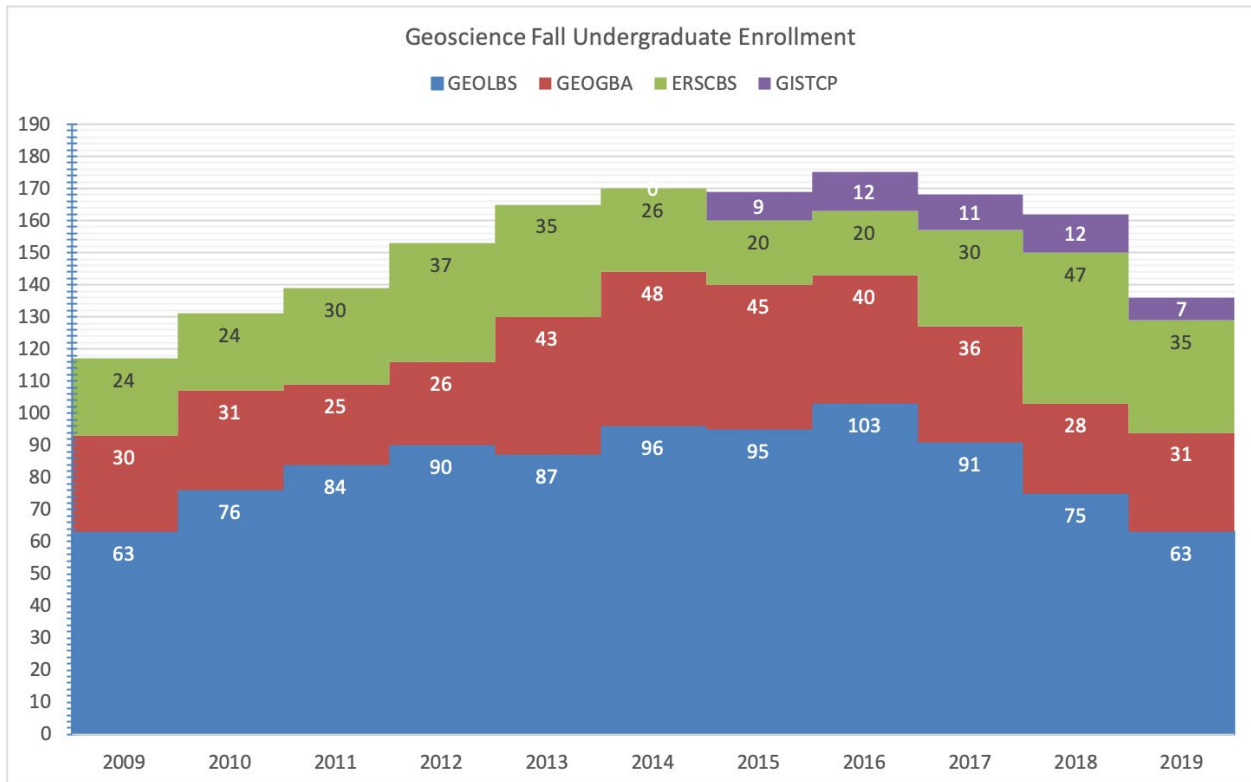


### Oil & Gas Business Indicators

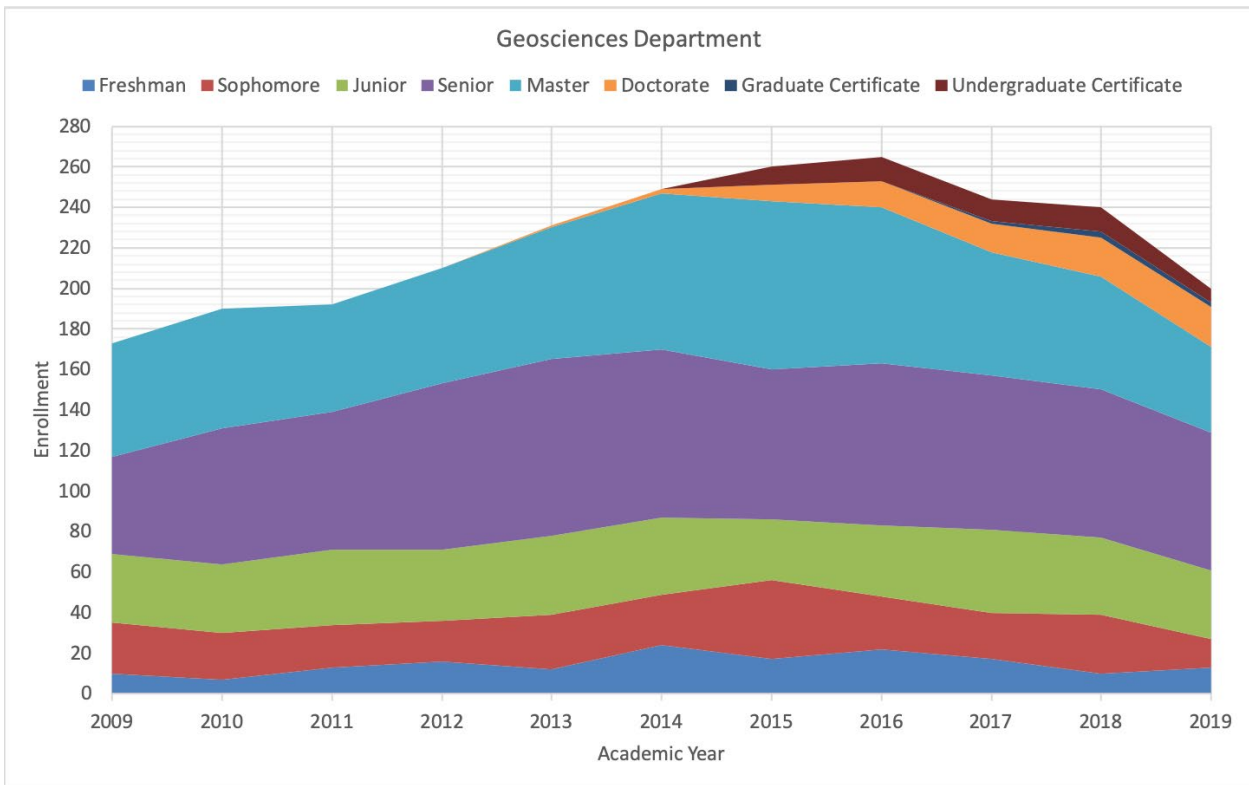
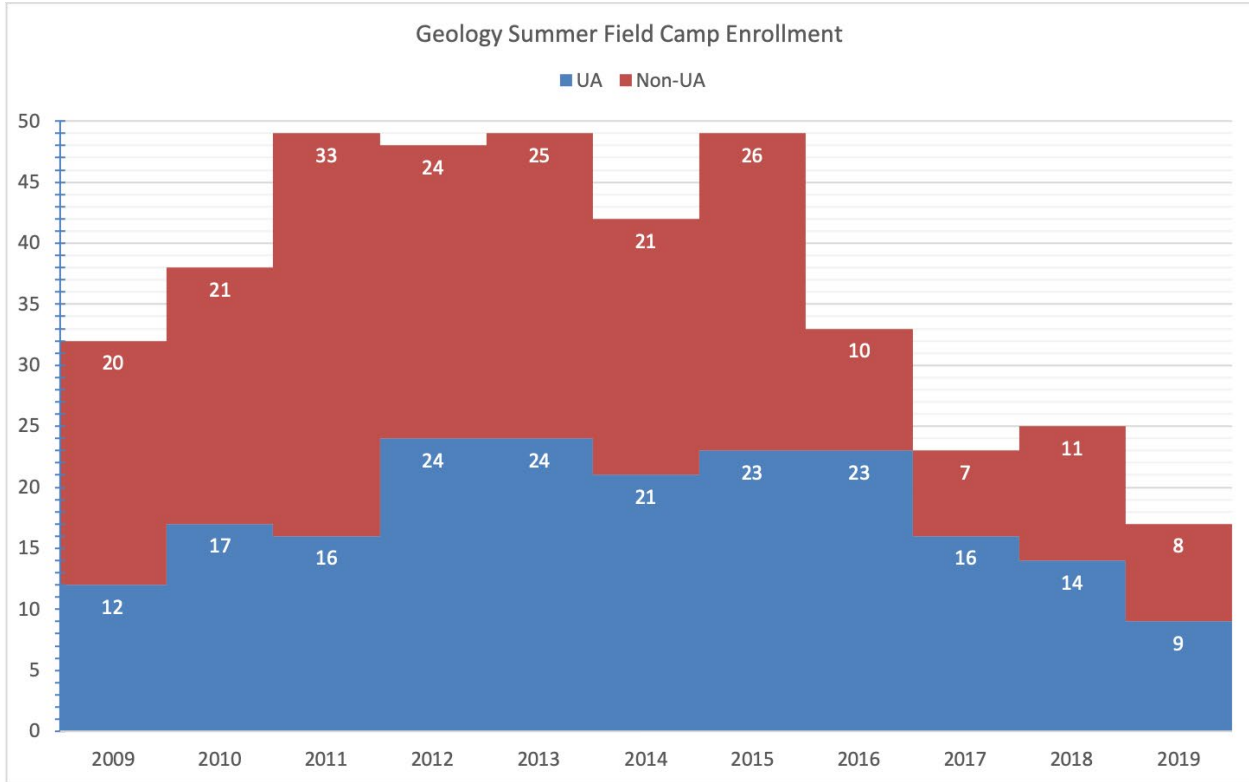
WTI Oil, Henry Hub Gas, US Rig Count  
 Christopher Liner, Univ. Arkansas, 22 Apr 2020



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**Honors students**

In April of 2002, the University of Arkansas received the largest gift in the history of American public higher education — a \$300 million commitment from the Walton Family Charitable Support Foundation.

The Honors College received more than one-third of this generous gift as an endowment to fund undergraduate Honors College fellowships and to provide support for study abroad and undergraduate research opportunities. The fellowships and grants help honors students finance their education, travel the globe and participate in ground-breaking research.

The University of Arkansas has a distinguished history of honors studies that dates back to 1954, when the honors program in the College of Arts and Sciences was established. In 1997 the Walton College of Business established its own honors program, focused on the needs of business students. Following the Walton gift, the Honors College partnered with faculty across campus to extend the honors experience to students in all disciplines, tailored to their specific majors.

Today the top students and most research-active professors from every college and major on campus participate, as a community of learners, in Honors College activities in the classroom, in laboratories and studios, and in sites around the world.

### **Honors Graduates in Geosciences Department (AY 2010-2019)**

*Unless otherwise indicated, students were considered primary students*

- ERSCBS – Earth Science, BS
  - 2013: 1 Honors Graduate
  - 2018: 1 Honors Graduate (Secondary, Primary GEOLBS)
- GEMEBA – Geography/Middle East Studies, BA (Discontinued)
  - 2011: 1 Honors Graduate (Secondary, Primary IRELBA)
  - 2012: 1 Honors Graduate
- GEOLBS – Geology, BS
  - 2010: 2 Honors Graduates
  - 2011
    - 1 Honors Graduate (Primary)
    - 1 Honors Graduate (Secondary, Primary MATHBS)
  - 2012: 2 Honors Graduates
  - 2013: 1 Honors Graduate
  - 2016: 1 Honors Graduate
  - 2017
    - 1 Honors Graduate (Primary)
    - 1 Honors Graduate (Secondary, Primary ARTBA)
  - 2018: 4 Honors Graduates

- GEOGBA – Geography, BA
  - 2009: 1 Honors Graduate
  - 2013: 1 Honors Graduate (Secondary, Primary HISTBA)
  - 2014: 1 Honors Graduate (Secondary, Primary ANTHBA)

2019 GEOS Honor Students							
FirstNam	LastName	Gender	Ethnicity	FirstGen	Other Plan	Other Plan	Classificati
Elizabeth	Cobb	F	Caucasian	No	BIOL-M		Senior
Maureen	Mantooth	F	Caucasian	No	ERSCBS		Senior
Kaylee	McAdoo	F	Caucasian	No	MATH-M	GEOL-M	Senior
William	Hadley	M	Caucasian	No	MUSC-M		Junior
Khalil	Buckmire	M	African Am	Yes	GEOLBS		Junior
Alysa	Fintel	F	Caucasian	No	SUST-M		Senior
Gunnar	Gregory	M	Caucasian	No	MUSC-M		Sophomore
Tori	Griffiths	F	Caucasian	No	ENGL-M		Junior
Josephine	Hall	F	Caucasian	Yes	ANTH-M		Junior
Sydney	McKim	F	Caucasian	No	CHEM-M		Senior
Billie	Niznik	F	Caucasian	No	SUST-M	MATH-M	Junior
Christopher	Schaubroeck	M	Caucasian	No	GEOLBS		Junior
Spencer	Wilbur	M	Caucasian	No	GEOLBS		Senior
Aaron	Alamo	M	Hispanic	Yes	PLSC-M		Junior
James	Morgan	M	Caucasian	No	JOPLBA		Sophomore
Abigail	Rhodes	F	Caucasian	No	MATHBS		Junior

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<b>2018 GEOS Honors Students</b>					
<b>Last</b>	<b>First</b>	<b>Acad Plan</b>	<b>Other Plans</b>	<b>GPA</b>	<b>Total Hrs</b>
Alamo	Aaron	GEOGBA	HISTBA	3.692	38
Cobb	Elizabeth	ERSCBS	BIOL-M	3.813	85
Fintel	Alysa	GEOLBS	SUST-M	4.000	68
Frucci	Mason	GEOLBS	INTB-M	3.784	134
Gilchrist	Seth	GEOLBS		3.631	160
Gonzalez	Colin	GEOGBA	ECNCBA	3.786	118
Gregory	Gunnar	GEOLBS	MUSC-M	3.385	13
Griffiths	Tori	GEOLBS	ENGL-M	3.864	44
Hall	Josephine	GEOLBS	GEOG-M	4.000	46
Hime	Regan	GEOLBS	PHYSBS	3.906	144
Hurlbut	Kaitlyn	GEOGBA	SUST-M	3.258	196
Hurlbut	Kaitlyn	GEOLBS	SUST-M	3.258	196
Mantooth	Maureen	ERSCBS	GISTCP	3.681	67
Mantooth	Maureen	ZZGEOG	GISTCP	3.681	67
McAdoo	Kaylee	ERSCBS	MATH-M	3.948	86
McKim	Sydney	GEOLBS	CHEM-M	3.797	105
Niznik	Billie	ERSCBS	MATH-M	3.771	61
Reynolds	Julia	GEOGBA	SUST-M	3.848	64
Schaubroeck	Christopher	GEOLBS		4.000	42
Stewart	Robert	GEOGBA		3.436	84
Tompkins	Tristan	GEOLBS		3.375	62
Watson	Andres	ERSCBS	CHBO-M	3.531	55
Webster	Michael	GEOGBA	GERM-M	3.833	64
Wilbur	Spencer	GEOLBS		3.697	93
Williams	Sarah	GEOLBS	PHYSBS	3.598	157

2017 GEOS Honors Students		
Last	First	Acad Plan
Cobb	Elizabeth	ERSCBS
Fintel	Alysa	GEOLBS
Frucci	Mason	GEOLBS
Gilchrist	Seth	GEOLBS
Gregory	Gunnar	GEOLBS
Hurlbut	Kaitlyn	GEOGBA
Hurlbut	Kaitlyn	GEOLBS
Mantooth	Maureen	ERSCBS
McAdoo	Kaylee	GEOLBS
McKim	Sydney	GEOLBS
Mosier	Meagan	GEOGBA
Niznik	Billie	ERSCBS
O'Hearn	David	GEOLBS
Schaubroeck	Christopher	GEOLBS
Tompkins	Tristan	GEOLBS
Truman	Kate	GEOLBS
Ward	Regan	GEOLBS
Watson	Andres	ERSCBS
Webster	Michael	GEOGBA
Wilbur	Spencer	GEOLBS
Williams	Sarah	GEOLBS

**B. Strategies to recruit, retain, and graduate students.**

At the undergraduate level, many of our majors come into the program from another department in their sophomore or even junior year. We would like to capture data on and understand this conversion process over time.

We also need to have a strong, consistent approach to UA freshman orientation held each summer. This is a group that has already committed to UA and there are substantial numbers who have not identified a major. Each department is given a chance to make a short presentation and we need to participate, then follow up to have interested students meet faculty advisors and other students in the major.

The notes below pertain to all student recruiting, with emphasis on building a diverse student body.

The Department of Geosciences has been active recruiting at the Geological Society of America Annual Conference (GSA), National Association of Black Geoscientists (NABG), Society for

Advancing Chicanos/Hispanic & Native Americans in Science (SACNAS), and most recently extending efforts to the American Geophysical Union Annual Conference (AGU).

We have been attending NABG since 2006 and the University of Arkansas has taken a leadership role in the organization with Faculty writing grants annually to fund all student participants attending the conference. We have been successful in receiving these funds since 2009. This creates networking opportunities for our students and a wonderful opportunity for us to recruit students as they are deciding on their next educational endeavor. From this long relationship with the NABG we have recruited students and had students referred to us by other students. Aside from recruiting this is a wonderful way to support our underserved students. The best message we can send is that we are pursuing opportunities that will help them. We have had many of our students hired by large oil and gas companies directly from this conference. We have hosted the annual NABG conference on our campus twice, in 2009 and 2019. This is another way to show our commitment to supporting students.

Faculty in Geosciences also attend SACNAS though the geological presence at that conference is quite limited.

We have been recruiting at the Geological Society of America conference since 2003. The consistency in attending has been good for the department. Students come by the booth each year and when they are ready to take the next step, they feel like they know us. This has been enhanced in recent years with S. Boss on the Diversity and Inclusion Committee at GSA and his grants have brought students to this meeting. This often provides multiple encounters with students at various meetings which helps our relationship with students and the chances they will choose the University of Arkansas.

The rationale of switching to the American Geophysical Union in 2019 relates to the number of faculty who attend this conference and the fact that the AGU meeting spans all our department areas of climate, GIScience, human geography and geology. This conference attracts over 25,000 attendees (GSA generally has 8,000) so there is a greater potential to speak with students looking for graduate programs. This recruiting trip was partially sponsored by a grant from the Graduate School and International Education. After attending this year, we believe that there are several reasons why this may not be the best match for recruiting purposes. We felt the timing of the conference is problematic since it is held each year just before the universities close for break and the applications are due quite soon after the university reopens in January. Secondly, the conference is so large and seems to be attracting more professionals and those looking for postdocs than undergraduates/masters level students looking for graduate programs.



The department holds a recruitment weekend for top MS and PhD applicants who are brought in and have a chance to decide if our program is a good fit for their needs. This is a particularly useful recruiting tool and we have had good success in students choosing to accept our offer.

Another program we have been working with is the Attracting Intelligent Minds (AIM) conference which is sponsored by the Black Graduate Student Association and the Graduate School. This visit targets highly qualified and underserved student populations. This is also a great recruiting tool to increase diversity and inclusion.

Attracting students to the University of Arkansas is not enough, especially for students who are from underserved populations. Students must feel a part of the departmental community which can begin Registered Student Organizations. Once here we offer various organizations to help students become a part of the department. These range from some traditional geoscience societies to those more likely to encourage and support underserved populations including: American Association of Geographers, GSA, AGU, Association of American Petroleum Geologists, American Society for Photogrammetry and Remote Sensing, Association for Women Geoscientists, Gamma Theta Upsilon, Geological Society of America, National Association of Black Geoscientists – UA Chapter, Graduate, Society of Exploration Geophysics, and Supporting Women in Geography.

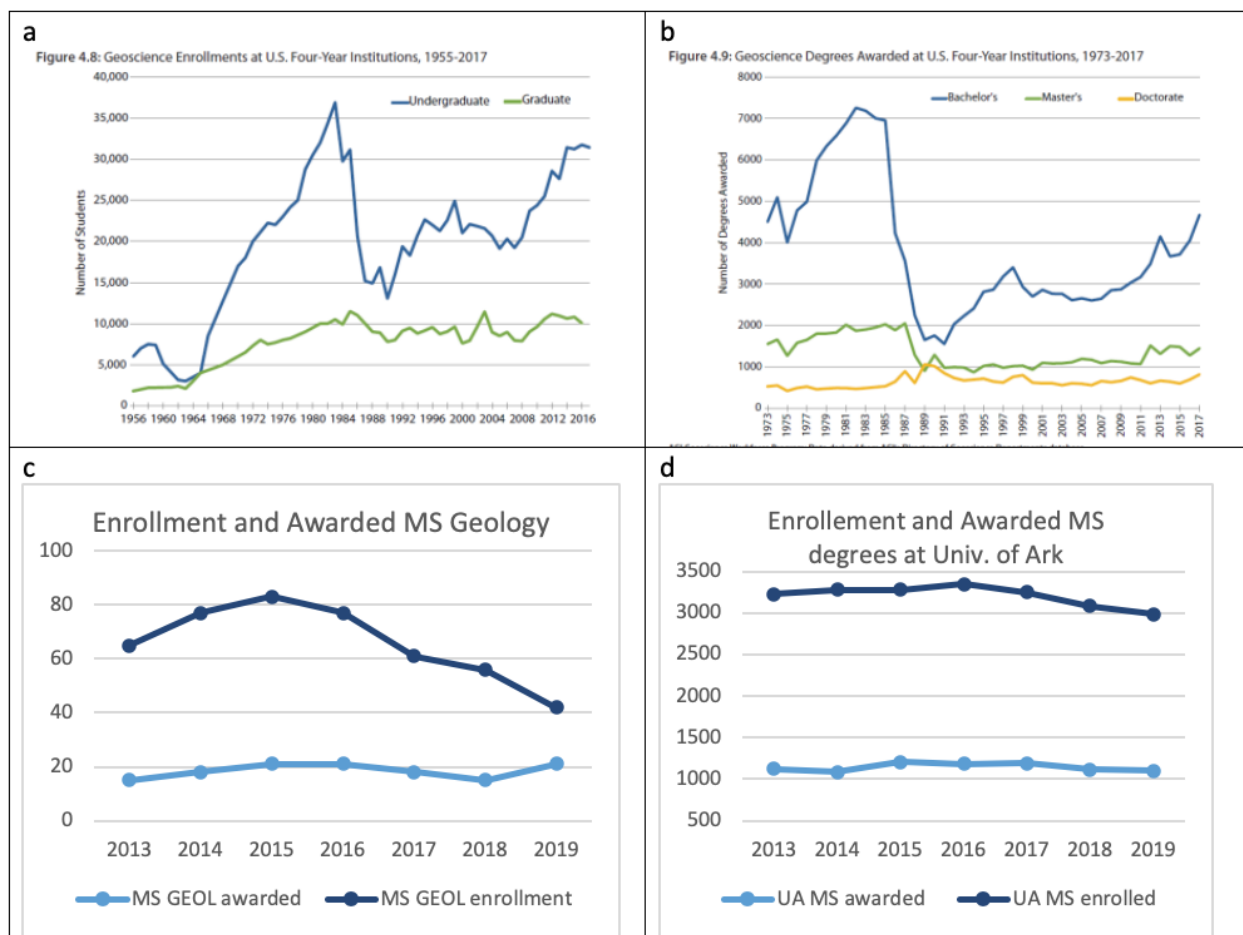
The department also holds weekly colloquia on a variety of topics where students attend and interact. A student-led social hour is held after each colloquium where students can mingle with faculty and local alumni. Throughout the year there are various events that bring the graduate students together from the annual GeoHog student research conference, fall chili cookoff and banquet, and spring awards banquet. The graduate students are housed in four large office suits where they can meet with students and offer each other assistance as they work through the program at varying levels.

### **C. Number of program graduates over the past three years**

#### National Trends

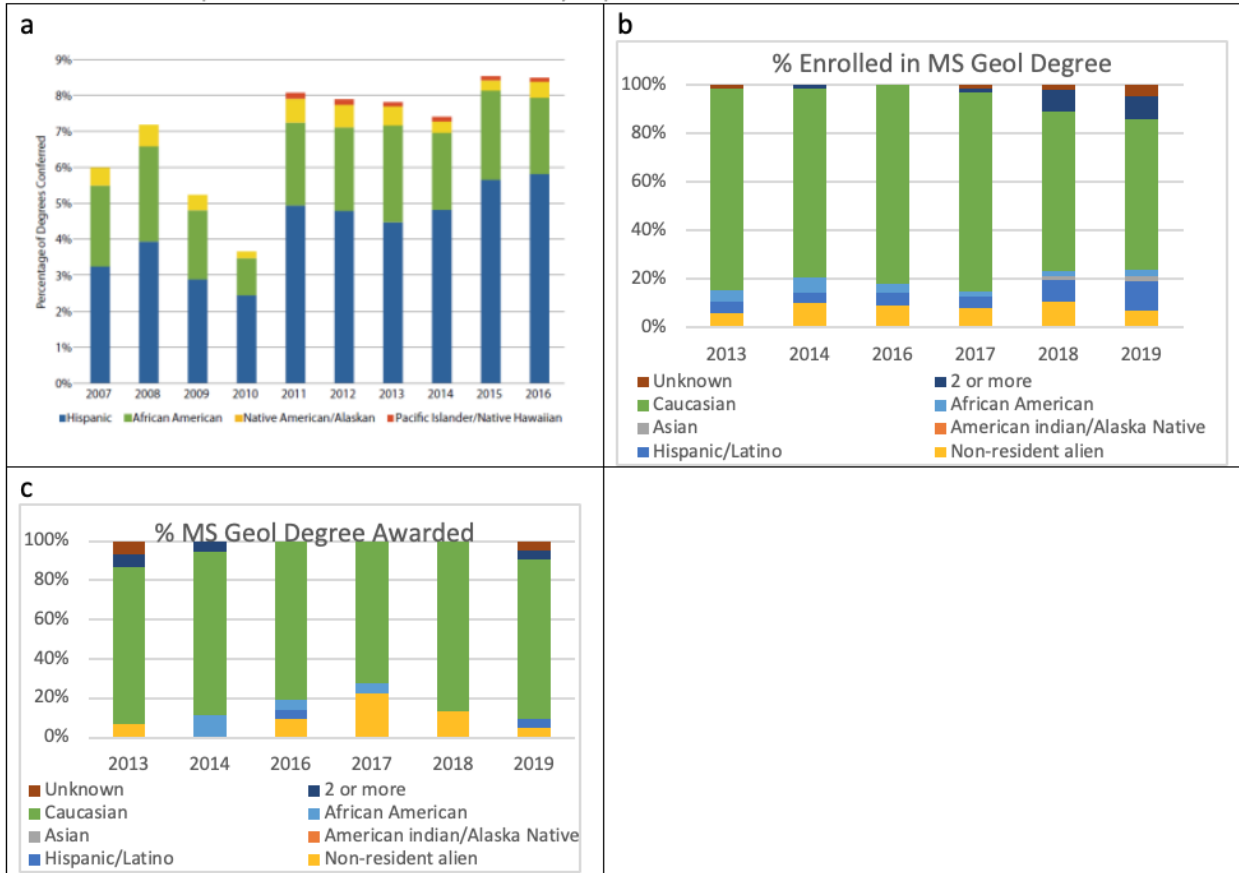
The number of degrees awarded in geosciences since 2012 has remained steady with a high point in 2012 at 11,165 students enrolled at 4-year institutions. This mirrors national trends in MS degree enrollment. The trend in MS students enrolled and awarded at the University of Arkansas also follows this national trend. With a slight decrease in the most recent years since 2015. For MS degrees in geology, enrollment has been decreasing since 2015. This seems to reflect a downturn on the price of oil and natural gas starting in those years (~2015) and a slowing of hiring of recent graduates by that industry. UA MS degrees awarded in geology seems to be holding steady with a slight decrease in 2018 (likely an effect of decreasing enrollment starting in 2015).

Enrollment and degrees awarded trends in geosciences for a) enrollment in all 4-year US institutions, b) degrees awarded in all 4-year US institutions, c) enrollment and degrees awarded in the MS geology degree program at the University of Arkansas (UA), d) overall enrollment and MS degrees awarded at UA.

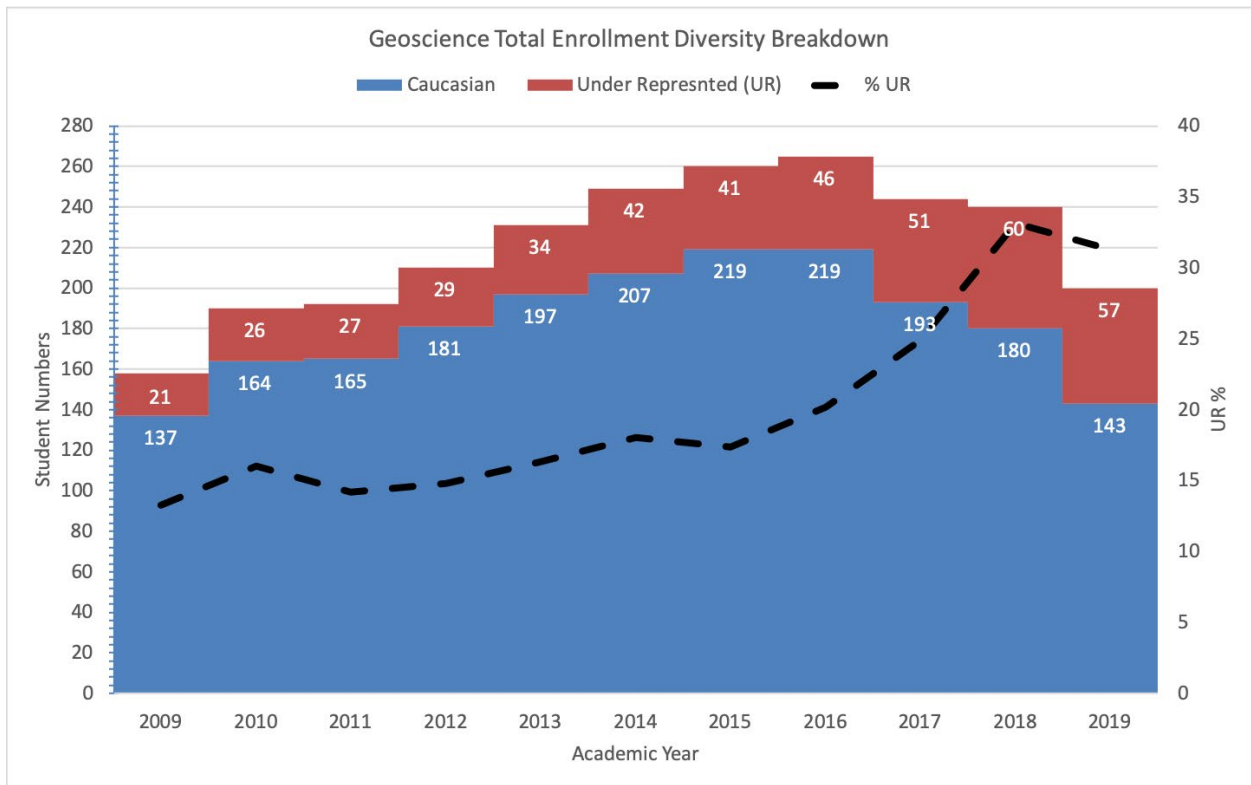
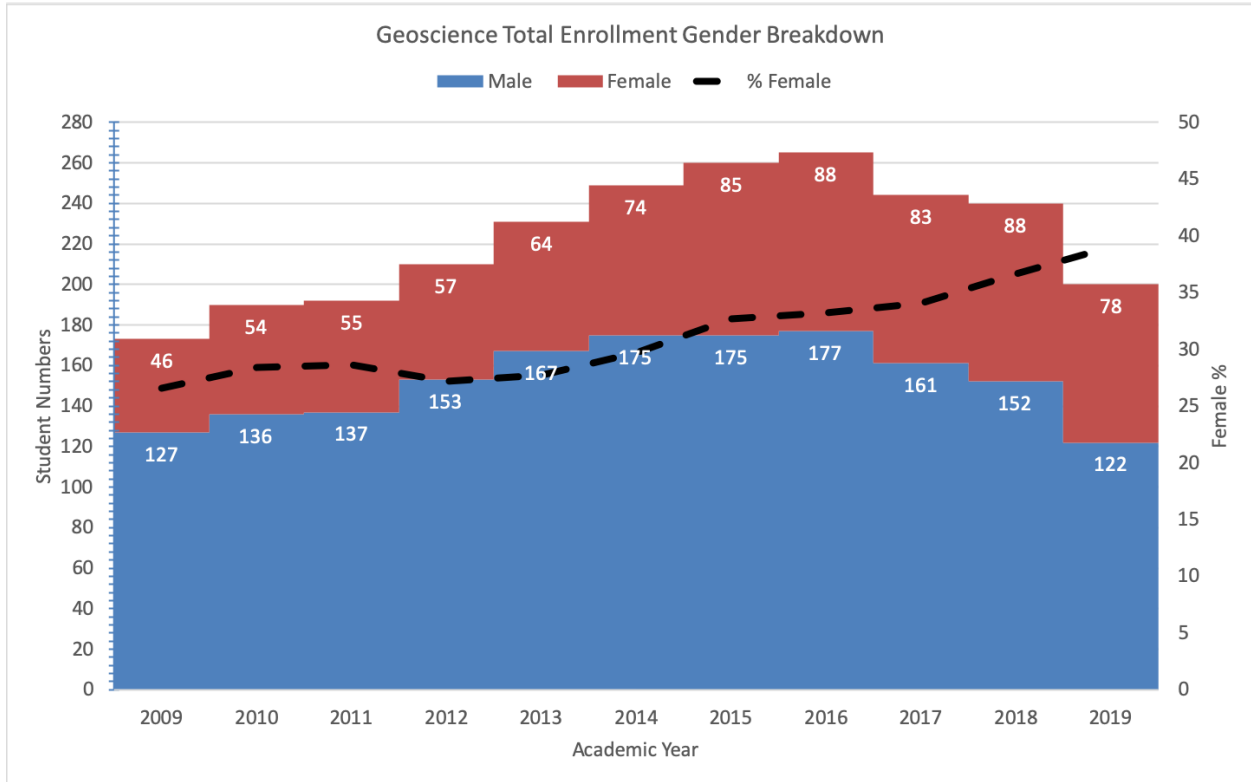


National demographic trends for MS degrees in geosciences awarded to underrepresented minorities is 3-12% of awarded degrees. This is a similar trend at the UA MS degree in geology. Enrollment has increased for underrepresented minorities going from 9% in 2012 to 26% in 2019, however, graduation rate or degrees awarded still remain low and do not follow this trend of enrollment. Degrees awarded to MS Geology students from underrepresented groups, goes from 0% degrees awarded in 2012, increasing to 17% in 2014, then decreasing to 5% in 2015, increasing to 10% in 2016 the falling in the next two years to 0% in 2018 and returning to 10% in 2019 (Figure 2).

Enrollment and degrees awarded based on demographic make-up for a) all geosciences MS degrees nationally, b) all groups enrolled in the geology MS degree at the UA and c) geology MS degrees awarded.

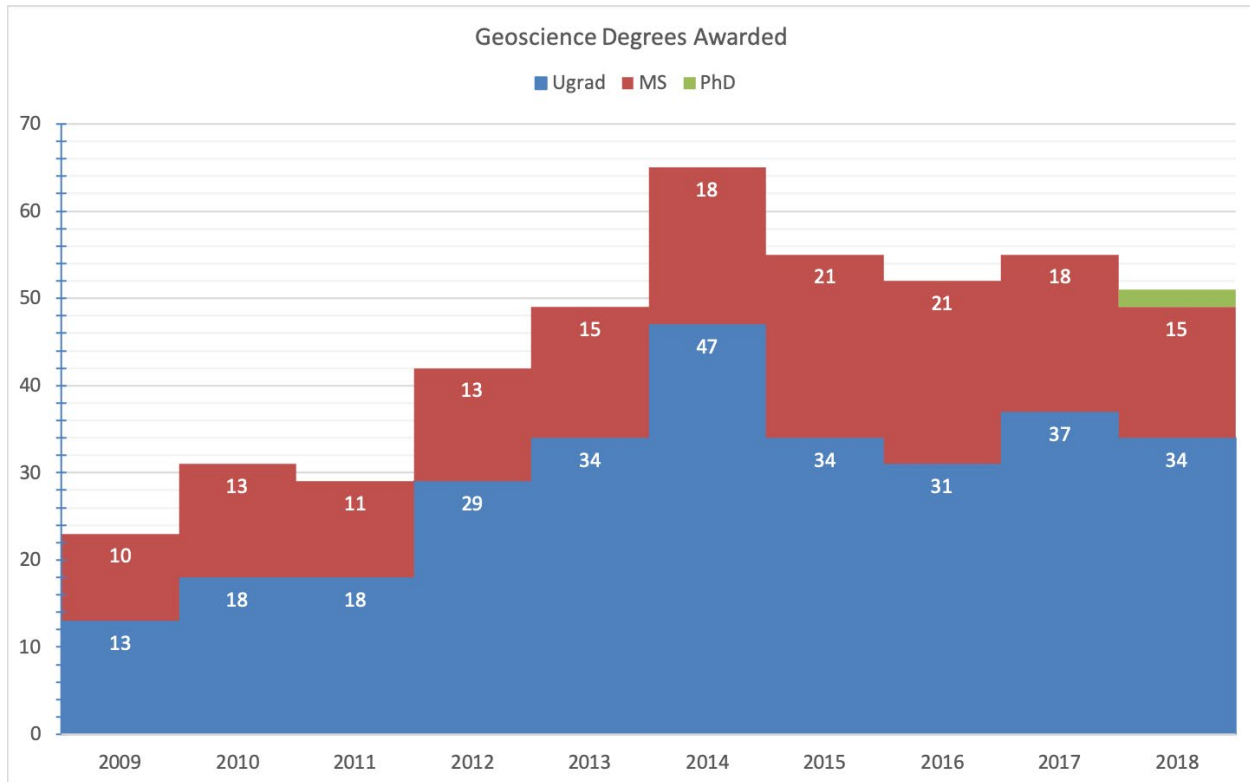


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**Geosciences Degrees Awarded from 2009-2019**

U Arkansas Department of Geosciences Self-Study Report 2020

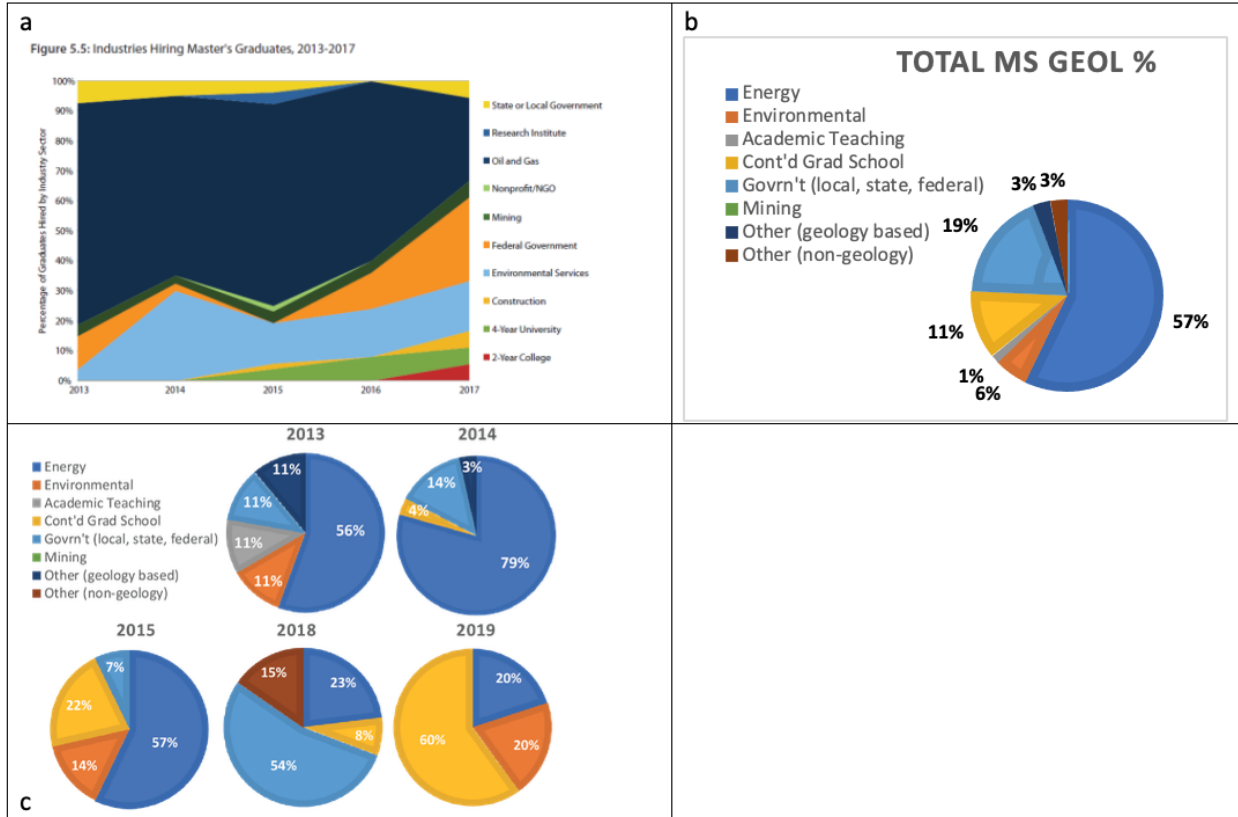


Degree	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>GEOS Degrees</b>	<b>23</b>	<b>31</b>	<b>29</b>	<b>42</b>	<b>49</b>	<b>65</b>	<b>55</b>	<b>52</b>	<b>56</b>	<b>51</b>	<b>63</b>
<b>BA/BS</b>	<b>13</b>	<b>18</b>	<b>18</b>	<b>29</b>	<b>34</b>	<b>47</b>	<b>34</b>	<b>31</b>	<b>37</b>	<b>34</b>	<b>39</b>
BS Earth Science	2	4	5	5	8	8	7	3	3	5	11
BA Geography	7	7	3	4	9	15	12	9	16	7	14
BS Geology	4	7	8	19	17	23	15	19	18	22	14
<b>MA/MS</b>	<b>10</b>	<b>13</b>	<b>11</b>	<b>13</b>	<b>15</b>	<b>18</b>	<b>21</b>	<b>21</b>	<b>18</b>	<b>15</b>	<b>21</b>
MA Geography deleted	4	5	4	8	7	3	6	4	1	1	1
MS Geography								2	4	7	4
MS Geology	6	8	7	5	8	15	15	15	13	7	16
<b>PhD</b>										<b>2</b>	<b>3</b>
<b>Certificates</b>								<b>1</b>	<b>1</b>	<b>3</b>	<b>3</b>
Proficiency								1	1	2	3
Grad Certificate										1	

**D. Market demand for careers stemming from the program.**

**Current Career trends and Market Demand.** According to the AGU 2018 report on geoscience workforce, there has been a decrease in the hiring of recent graduates at all degree levels. Between 2014 and 2016 there was a decrease in hiring by the oil and gas industry which is reflected in the number of students enrolled in the MS degree in geology at the UA. During this downturn in hiring, increases nationally are seen in the hiring of graduates to the environmental industries and government. Again, this is reflected as well in the MS degree in geology at the UA (Figure 3). Overall, between 2013 and 2019, 57% of our students with an MS degree in geology attain careers in the energy industry. This is followed by 19% of graduates going into positions with local, state or federal government (e.g. Arkansas Geological Survey) and 11% of graduates continuing on to pursue a second graduate degree, namely continuing on to a PhD degree either at the UA or other institutions. The changes over the last 7 years in hiring trends nationally is also seen in UA graduates with MS degrees in geology, with a high of 79% of MS Geology graduates going into the energy industry in 2014 and decreasing to just 20% in 2019 with 60% of students continuing on to pursue a PhD degree 2019. However, this trend may be inflated due to a lack of response to career surveys and a lack of data for 2016 and 2017.

Geosciences hiring trends for a) national trends in all MS degrees in geosciences awarded, b) UA MS in geology students surveyed from 2013 to 2019 and c) a breakdown of trends from year to year with a data gap in 2016 and 2017.



### Future Hiring Trends and Market Demand

As reported in the 2018 AGU workforce report, the Bureau of Labor Statistics suggests that there will be a deficit of ~ 118,000 geoscience full-time equivalents by 2026. It is too early to determine what the recent decrease in oil and natural gas due to the global COVID-19 pandemic and oil/gas conflict between Russia and OPEC, however all indications are this will significantly impact the hiring of our recent graduates. As of the end of March based on personal communications with students, several mid-level oil/natural industries have either rescinded positions or cancelled internship programs suggesting market demand for the energy industry will be significantly less in the coming year. Industries hiring for the MS degree in geology will continue to be oil/natural gas with the greatest increase in percent change in numbers of jobs being highest for petroleum engineers (~15%), geoscientists (~14%), atmospheric and space scientists (~12.5%), environmental scientists (~11%), and hydrologists (~10.5%). Of this list of careers, geoscientists, environmental scientists, and hydrologists would be the biggest employers for our MS graduates since petroleum engineers and atmospheric and space sciences require either a secondary MS degree in engineering or a PhD degree.

Quick Facts: Geoscientists	
2019 Median Pay ?	\$92,040 per year \$44.25 per hour
Typical Entry-Level Education ?	Bachelor's degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	None
Number of Jobs, 2018 ?	31,000
Job Outlook, 2018-28 ?	6% (As fast as average)
Employment Change, 2018-28 ?	1,800

Quick Facts: Hydrologists	
2019 Median Pay ?	\$81,270 per year \$39.07 per hour
Typical Entry-Level Education ?	Bachelor's degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	None
Number of Jobs, 2018 ?	6,700
Job Outlook, 2018-28 ?	7% (Faster than average)
Employment Change, 2018-28 ?	400

Job Title	Entry-Level Education	Median Pay	Number of Jobs (2018)	2018-2028	
				Jobs Growth	Employment Change
All Life, Physical and Social Science Careers	Varies	\$ 66,000	1.4M	7%	97,400
Atmospheric Scientists including Meteorologists	BS	\$ 94,000	10K	8%	800
Cartographers and Photogrammetrists	BS	\$ 64,500	11.8K	15%	1,700
Conservation Scientists and Foresters	BS	\$ 61,300	32.9K	3%	1,000
Environmental Scientists and Specilists	BS	\$ 71,100	85K	8%	7,000
Geographers	BS	\$ 80,300	1.5K	3%	0
Geoscientists	BS	\$ 91,100	31K	6%	1,800
Urban and Regional Planners	MS	\$ 7,300	39.1K	11%	4,200
Post Secondary Teachers	PhD	\$ 79,500	1.35M	11%	155,000

### Career Paths of Geographers 2020



Many geographers pursue careers in education, business, local, state, or federal government agencies, and nonprofit organizations. The Association of American Geographers (AAG) has divided the career sectors as follows:

**Education** - The education sector includes K through 12 institutions, colleges and universities that award at least a two-year degree, continuing education and informal education organizations, and higher education institutions. Educators may also work in educational administration and academic research positions.

**Business** - The business, or private, sector refers to the segment of the economy composed of enterprises owned by individuals or groups. Corporations are accountable to their shareholders and operate at national or international scales. Independent businesses are privately owned by an individual or small group and usually operate at a local or regional scale.

**Government** - Applicants new to the public sector, which includes federal, state, and local government, may find the broad, integrative perspective offered by academic training in geography to be an asset. Nearly 2 million civilians—1.8 percent of the U.S. workforce—are employed by the federal government, while state and local governments employ 19.8 million workers. Geography's emphasis on addressing real-world problems and issues is excellent preparation for public sector employment, particularly at the local and state levels where much policy innovation, implementation, and bottom-line responsibility reside.

**Nonprofit (NGO)** - Roughly nine percent of the U.S. workforce (12 million individuals) is employed by an estimated 1.4 million nonprofit organizations, whose causes and values span the entire political spectrum. Because nonprofits typically strive to create a better world (as defined by their mission statements), they offer great opportunities for job seekers hoping to make a difference.

These career paths can be classified into these various employment sectors:

- Agriculture, Forestry, Fishing and Hunting Transportation and Warehousing
- Professional, Scientific, and Technical Services, Real Estate and Rental and Leasing
- Mining, Quarrying, Oil, Gas Extraction Energy and Information Services
- Management of Companies and Enterprises, Energy Management and Utilities
- Waste Management and Remediation Services Arts, Entertainment, and Recreation
- Construction, Manufacturing, Materials Distribution Services
- Health Care and Social Assistance, Education and Educational Services
- Retail Trade and Wholesale Training Finance and Insurance
- Accommodation and Food Services Public Administration

Also, since the field of Geography has been traditionally and conventionally divided into the three (3) subdisciplines of Physical, Human, and Geomatics (GIScience), career paths are found in these educational and training thrusts:

#### Environmental Specialists

Geographers often work as environmental consultants to ensure that commercial or government clients comply with regulations and address a variety of environmental issues. This is a varied role, typically focusing on identifying whether an area of land, air, or water is polluted, and what the impact would be, by means of desk-based research and/or field work. Environmental consultancy offers the opportunity for a structured career path with the potential to specialize in an area of interest. Work experience would be very beneficial for entry in this role, with potential employers including water-related organizations and the government.

#### Cartographers and GIS

Geographers – whether physical- or human-focus – can pursue career paths in cartography/GIS which involve developing and producing different types of maps, as well as producing related diagrams, charts, spreadsheets and travel guides. Cartographer’s work may also include the restoration of old maps and historical documents. Cartographers/GIS technicians work within a variety of areas, including publishing, government, surveying, and conservation. The field also draws on an array of advanced technologies, such as geographical information systems (GIS), remote-sensing, satellite imagery, and digital-mapping technologies.

#### Urban Planners

Geographers from human geography and geomatics can pursue careers as urban planners where they deal with the management and development of towns, cities, and rural communities and zoning. Geographers put their toolkit of analytical skills and knowledge to improve existing infrastructure and find solutions to environmental issues, as well as ensuring new developments are in line with various policies and regulations. A part of the job will be to satisfy the needs of businesses and local communities, while ensuring that development is sustainable and natural environments are maximally preserved.

#### Geographer as Educators

You may also like to pass on your geography skills and knowledge to the next generation as a geography teacher in a secondary school, college or further education institution. Like other teaching roles, this will usually require completion of a specialized teaching qualification and/or specialized study at master’s or PhD level. You’ll need excellent communication skills, creativity and commitment to your subject. You’ll also need to keep up to date with new developments in geography and perhaps arrange field trips as a practical learning method.

#### Geomorphologists

Physical Geographers often work in fields related to Geomorphology: the study of individual features and the processes that create them. These subfields in Geography can include work and research in physical (such as weather), environmental (glaciers), chemical (weathering and rock erosion), or biological (landscape affected by plants, trees or animals). Geomorphologists look at landform history and study the causes and effects of terrestrial and extraterrestrial events on the ecology and various landscapes. Such events can include how land is shaped by a single volcanic eruption, the ebb and flow of the tides (and therefore coastal erosion or silt deposits), and/or meteorite strikes and other effects. Geomorphologists study *landform* the concept of topography as a localized phenomenon.

Geography is a broad-based discipline bridging the natural and social sciences. Job prospects for graduates are diverse and the hiring market has been strong in recent years. Employment sectors include business, government, non-profits, and education. Potential career paths for those with training in physical geography (e.g. geomorphology, climatology, biogeography, hazards) include environmental consulting, emergency management, and forestry. For human geographers, careers include demographer, urban and regional planner, and historic preservation. Demand for skills in GIS and spatial analysis has been consistently high in recent years, and potential careers include geospatial analyst, cartographer, and GIS technician (see [this link](#) for a discussion of other potential career paths across all fields).

Enrollment in the Geography BS degree at the University of Arkansas has fluctuated over the past decade, with a high of 48 students in 2014 and low of 25 in 2011. There are currently 31 students enrolled in the degree program (as of 2019) ([source](#)).

Data for relevant careers are provided in Table 1 and draw on information from the Bureau of Labor Statistics' [Occupational Outlook Handbook](#). Market demand for employment is strongly dependent on job title and sector. This is not a comprehensive list of possible occupations for geography BS graduates but does attempt to sample a range of potential occupations.

Information table on market demand for a sample of geography related careers ([source](#)) is shown below.

**E. Job placement information for program graduates**

Graduate	Degree/year	Position	In-field?
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U Arkansas Department of Geosciences Self-Study Report 2020

Francis, Tia	MS GEOS 2020	Research Librarian, University of North Carolina, Chapel Hill, NC	Y
Goodman, Casey	MS GEOS 2020	Black Hill Energy	Y
Morris, Amy	MS GEOS 2020	Disney World Visitor Operations, Orlando, FL	Y
Nagy, Kristine	MS GEOS 2020	GIS Consultant Dallas	Y
Alotaibi, Mislal	MS GEOS 2019	PhD student U of AR	Y
Cowen, Christopher	MS GEOS 2019	CIES ETA Instructor Uzbekistan	Y
Donald, Larry	BS ERSC 2019	Professional Athlete US Track and Field	N
Edmondson, Alan	MA GEOS 2019	NW Arkansas Land Trust	Y
Garcia, Christian	MS GEOS 2019	Black Hills Energy	Y
Kouchehbaugh, Sara	MS GEOS 2019	ETA Instructor Azerbaijan	Y
Morris, John	BS ERSC 2019	ExxonMobil	Y
Pryor, Chris	MS GEOS 2019	Visual Precision Cartography	Y
Quintero, Virgilio	MS GEOS 2019	PhD candidate University of Arkansas ENDY	Y
Raley, Kristina	MS GEOS 2019	TX Commission on Environmental Quality	Y
Simbo, Christophe	MS GEOS 2019	PhD candidate Colorado State University	Y

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Smith-Loerts, Rachel	MS GEOG	VISLab, University of Arkansas	Y
Sokolowski, Kelly	MS GEOS 2019	Vanguard Environmental	Y
Terhune, Julie	MS GEOS 2019	ESRI Cartographic software engineer, Los Angeles, CA	Y
Asbury, Zachary	MS GEOS 2018	GIS Officer Springdale Water Department	Y
Amaral, Chelsea	BS GEOG	MS student University of Arkansas	Y
Barca, Jasmyn	BA GEOS 2018	Packrat Outdoor Center	N
Barker, Abram	MS GEOS 2018	Texas Geologic Services	Y
Bottoms, Bryan	MS GEOS 2018	Tapstone Energy, LLC	Y
Brice, Katie	BS GEOS 2018		
Brooks, Dominic	BS GEOS 2018	UPS	N
Brown, Dustin	BA GEOS 2018		
Clyne, Jacob	MS GEOS 2018		
Coulter, Kaitlyn	BS GEOS 2018	Mountain Top Events	N
Davis-Beaupre, Terri	BA GEOS 2018		
Davison, Landon	GEOS – minor 2018	Back Roads	
Denham, William	MS GEOS 2018	Apache Corporation	Y

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Ford, Hanna	MS GEOS	Phd candidate University of Arkansas	Y
Fulenwider, Matthew	BA GEOS 2018	Palmetto Engineering and Consultants	Y
Frucci, Mason	BS GEOS 2018	MS student Baylor	Y
Harmon, William	MS GEOS 2018	USGS Little Rock	Y
Gilbert, John	ERSC BS 2018	Gun Salesman	N
Gilbert, John	M GEOS 2018		
Gilchrist, Seth	BS GEOS 2018		
Groh, Jess	BS GEOS 2018		
Gross, Rachel	BA GEOS 2018	City of Bentonville	Y
Hime, Regan	BS GEOS 2018	MS student University of Oklahoma	Y
Jordan, Joseph	MS GEOS 2017	Arkansas Department of Transportation	Y
Jordan, Nicholas	BS ERSC 2018		
Joyce, Keaton Jenkins	BS GEOS 2018	MS Student University of Arkansas	Y
Keeling, Aubrye	GEOS - minor 2018	Scott Family Amazeum	
Kilcoyne, David	MS GEOS 2018		
Kincade, Sean	MS GEOS 2018	Oil & Gas Explorationist	Y

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Leonard, Ashlon	MS GEOS 2018	Arkansas Department of Environmental Quality	Y
Leppold, Anne	BS GEOS 2018	Bull Shoals White River Park	Y
Liner, Thomas	MS GEOS 2018		
Long, Austin	BS GEOS 2018	Beck Group	Y
Longstreth, Lee	BS ERSC 2018		
Mahanay, Sidney	MS GEOS 2018		
Mantooth, Deanna	BS GEOS 2018	MS student University of Arkansas BIO Ag Engineering	Y
Mc Clain, William	BS GEOS 2018		
Mc Collum, Jake	MS GEOS 2018	Integrated Farming	Y
Mc Farlin, Forrest	MS GEOS 2018	PhD candidate Colorado School of Mines	Y
Mc Kenzie Lea, Meredith	BS GEOS 2018		
Mc Lain, William	BS GEOS 2018	Brown & Gay Engineers	N
Molesso, Jordan	BA GEOG		
Montana, Quinn	MS GEOS 2018	PhD candidate University of Arkansas- ENDY	Y
Mowatt, Kermar	BS ERSC 2018		
Nance, David	MS GEOS 2018		Y

Nash, Ethan	BA GEOS 2018		
Nash, Jami	GC GIST 2018		
Newman, Katelyn	GEOS – minor 2018	Graduate student Southern Methodist University	Y
Newton, Danadeshan	GEOS – minor 2018		
Parker, Quentin	BS GEOS 2018		
Roberts, Jordan	BA GEOS 2018	Cartographer	Y
Robertson, Christopher	BA GEOS 2018	Lewis and Clark Outfitters, Software Developer	Y
Rodriguez, Josue	MS GEOS 2018	Colorado River Municipal Water District	Y
Rollans, Justin	MS GEOS 2018	EFS Geotechnologies	Y
Rowden, Kyle	MS GEOS 2018	City of Springdale	Y
Rowlett, Jake	MS GEOS 2018	PhD candidate University of California -San Diego	Y
Rusconi, Francisco	MS GEOS 2018	Tec Petrol (Argentina)	Y
Sachs, Cora	BA GEOS 2018	Krochet Kids International	Y
Sanks, Kelly	MS GEOS 2018		
Santiago, Katelynn	GEOS – minor	Zweig Group	Y
Schindler, Cody	CP GIST 2018	Frontier Metrol Planning	Y



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Sena, Matthew	M GEOS 2018	Graduate student West Virginia University	Y
Smirnov, Andrey	MS GEOS 2018	JB Hunt Transport	N
Sparks, Chase	BS GEOS 2018		
Spellins, Christopher	BS ERSC 2018		
Taccolini, Dominic	GEOS – minor 2018	Pro Baseball	N
Vranovci, Korab	MS GEOS 2018	PhD candidate University of Arkansas – ENDY	Y
Whaling, Amanda	MS GEOS 2018	USGS	Y
Williams, Sarah	BS GEOS 2018	Phd candidate Vanderbilt	Y
Williams, Timothy	BS GEOS 2018	MS student University of Alaska	Y
Wise, Matthew	BS ERSC 2018		
Wyatt, Katie	MS GEOS 2018	CAST University of Arkansas	Y
Young, Holly	MS GEOS 2018	City of Springdale, AR	Y
Brunick, Josie	MS GEOS 2017	EOG Resources	Y
Coffey, Thomas	MS GEOS 2017	Haliburton	Y
Duplantis, Andie	MS GEOS 2017	Data Analyst, TRICOL Biomedical, Portland, OR	Y
Galloway, Benjamin	MA GEOS 2017	U of Arkansas Academic Support	N

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Morris, Noah	MS GEOS 2017	PhD candidate University of Arkansas	Y
Parry, Sean	MS GEOS 2017	GHD Environmental Ltd	Y
Rhodes, Richard	MS GEOS 2017	Arkansas Department of Transportation	Y
Ruggeri, Matt	MS GEOS 2017	Independent Geologist	Y
Stokes, Josh	MS GEOS 2017	Halliburton	Y
Thaler, Evan	MS GEOS 2017	PhD candidate University of Mass.- Amhurst	Y
Tracy, Benjamin	MS GEOG2017	Conexon, LLC	Y
Voorhees, Jamey	MS GEOS 2017	PhD candidate Oklahoma State University	Y
Al-Asadi, Fatimah	MS GEOS 2016	Haliburton Worldwide	Y
Blaylock, Matt	MS GEOS 2016		
Brawner, Erik	MS GEOS	City of Des Moines, Iowa	Y
Chen, Yirong	MS GEOS 2016		
Garmon, Will	MS GEOS 2016	Tradebe Treatment and Recycle	Y
Holcomb, Ginny	MS GEOS 2016	Washington Co., AR	Y
Johnson, Calvin	MS GEOS 2016	Geolog International	Y
Keeling, Ryan	MS GEOS 2016	Southwestern Energy	Y
Labusch, Loren	MS GEOS 2016	SubTeachUSA	N

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Lilly, Josef	MS GEOS 2016	Arkansas Highway and Transportation	Y
Mc Cain, Gordon	MS GEOS 2016	DB & D Service	Y
Meizler, Michael	MA GEOS 2016	Eldorado HS	Y
Moser, Daniel	MS GEOS 2016	Toledo Mud Logging Svc	Y
Murch, Weston	MS GEOS 2016	ESRI	Y
Philbrick, John	MS GEOS 2016	Hunt Oil Company	Y
Ply, Dustin	MS GEOS 2016	CTEH	Y
Roland, Victor	PhD ENDY 2016	USGS Nashville	Y
Shew, Aaron	MS GEOS 2016 (PhD ENDY 2018)	Assistant Professor, Arkansas State University, Jonesboro, AR	Y
Solomon, Edwin	MS GEOS 2016	Real Estate Developer	N
Spencer, Kyle	MS GEOS 2016	Oseberg	N
Tinsley, Margaret	BS GEOS 2016	PhD candidate University of Arizona	Y
Turner, Noel	MS GEOS 2016	US Fish and Wildlife Cape May National Wildlife Refuge	Y
Wang, Yueyand	MS GEOS 2016	PetroChina	
Wood, Victoria	MS GEOS 2016	Railroad Commission of Texas	Y
Yin, Ruizhe	MS GEOS 2016		

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Ahrens, Laura	MA GEOS 2015	Real Estate	N
Al-Kandari, Mohd	MA GEOS 2015	PhD candidate U of Florida	Y
Bahram, Ikram	MS GEOS 2015	PhD candidate University of Arkansas – ENDY	Y
Bennett, Laura	MS GEOS 2015	Kinder Morgan	Y
Brown, Carolyn	MS GEOS 2015	Chesapeake Energy	Y
Burns, Jordan	MA GEOS 2015	FEMA	Y
Crawshaw, James	MA GEOS 2015	MO Dept. of Natural Resources	Y
Gadeke, Daniel	MA GEOS 2105	US Army Spatial Analyst	Y
Groom, Kaelin	MA GEOS 2015 PhD ENDY 2017	UNESCO Project Director, Jordan	Y
Hamlin, Alex	MS GEOS 2015	FTN Associates	Y
Kirk, Clara	MS GEOS 2015	US Park Service	Y
Knobbe, Todd	MS GEOS 2015	PhD candidate Rensselaer Polytech	Y
Kumbalek, Mike	MS GEOS 2015	Devon Energy	Y
Langford, Brock	MS GEOS 2015	Sabinal Energy, LLC	Y
Linck, Rachel	MS GEOS 2015	PhD candidate University of Arkansas	Y
Liner, Kevin	MS GEOS 2015	Stephens Production Company	Y

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Mathis, Derrell	MS GEOS 2015	Shell	Y
Moore, Matt	MS GEOS 2015	Urban Planning Associates	Y
Moyers, Austin	MS GEOS 2015	Swanky Smiles	N
Otto, Daniel	MS GEOS 2015	Southwestern Energy	Y
Peck, Matt	MA GEOS 2015	City of San Marcos, TX	Y
Rogers, Trenton	MS GEOS 2015	Spyglass Energy	Y
Sherman, Janelle	MS GEOS 2015	ExxonMobil	Y
Vaughn, Kiefer	MS GEOS 2015	Pollution Management	Y
West, Alex	MS GEOS 2015	Devon Energy	Y
Whittle, Julie	MS GEOS 2015	Atoka	Y
Xue, Bowei	MA GEOS 2015	GIS Software Developer China	Y
Alenezi, Meshari	MA GEOS 2014	Professional GIS/Cartographer, Kuwait City, Kuwait	Y
Mickens, Rashauna	MA GEOS 2010	Instructor, Geosciences Dept., University of Arkansas	Y
Angel, Christopher	MA GEOS 2008 (PhD ENDY 2017)	Assistant Director, Center for Advanced Spatial Technology (CAST), Fayetteville, AR	Y

Al-Jawarneh, Rana	MS GEOS 2008	Assistant Professor, University of Yarmouk, Jordan	Y
Jaber, Dawn	MA GEOS 2008	GIS Specialist, City of Fayetteville, AR	Y
Sarhan, Michael	MA GEOS 2006	Analyst and Cartographer, U.S. Army Corps of Engineers Cartography, Denver CO	Y
Roberts, Paxton	MA GEOS 2006	Director, NW Arkansas Bike Coalition	N
Kirkland, Stephanie	MA GEOS 2005	Professional GIS Analyst Toronto, Canada	Y
Salem, Mohamed	MA GEOS 2003 (PhD ENDY 2011)	Census Data Analyst, US Department of Commerce,	Y
Al-Kamali, Abudullah	MA GEOS 2002	Data and Spatial Analyst, Ministry of Environment, Kuwait City, Kuwait	Y

**F. PhD program career trends**

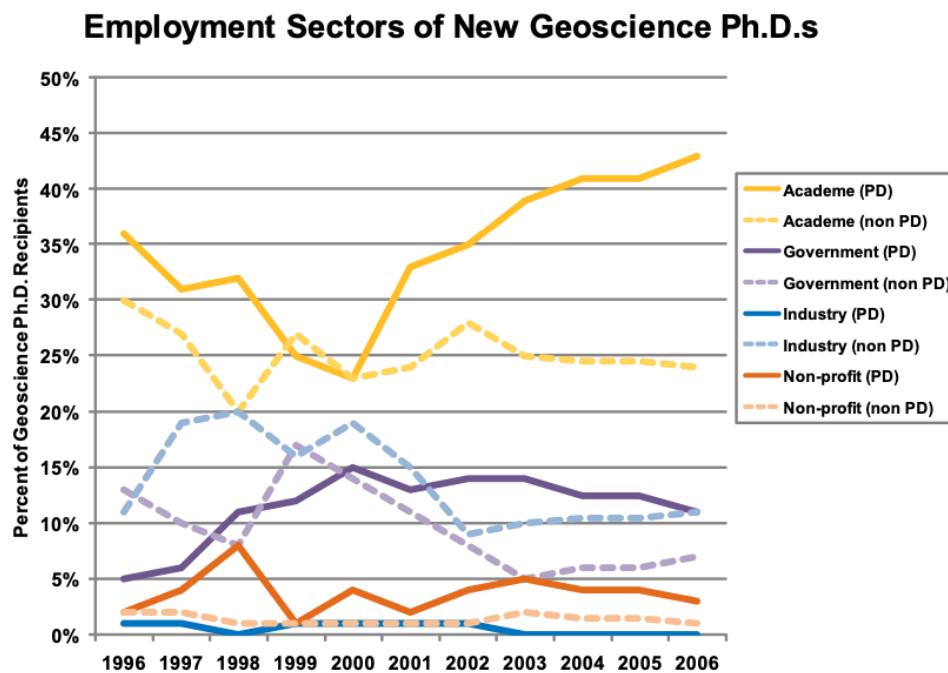
The Geosciences PhD program accepted its first student in Fall 2013. Eight students have graduated the program since the first students graduated in Spring 2016, and we expect an additional 11 graduates by the summer of 2021. We remain in contact with each of the 8 students. Seven of eight continue to use their doctoral degrees in their professions. Four of our PhDs are research postdocs in Physics, Civil Engineering, and Geosciences Departments. Two work for the state and federal government. One is a teaching assistant professor.

We have made one key adjustment to the program from observing these trajectories. We noticed that the PhD qualifying exam was a major stumbling block. The old exams required (a) an extensive written exam, (b) a written proposal, both of which needed to be written in 30 days.

Additionally, if a student was working on a funded project, a second proposal on a different topic needed to be written to show a student’s independence. This work was stressful, and often not completed until the 3<sup>rd</sup> year, putting them behind schedule.

Over the 2018-2019 academic year, the PhD coordinator (Shaw), the PhD committee (Marshall, Sharman, Paradise, Cothren, Davidson), and Tullis (curriculum committee) worked together to make the Candidacy Exam more manageable and communicated more clearly. Under the new organization, students may begin writing their research proposal upon entering the program, and must only write the review paper (written exam) during the 30 day window.

The figure below is a bit out of date (2006), but gives some idea on Geoscience PhD career options (post doctoral ‘PD’, and non postdoctoral ‘non PD’).



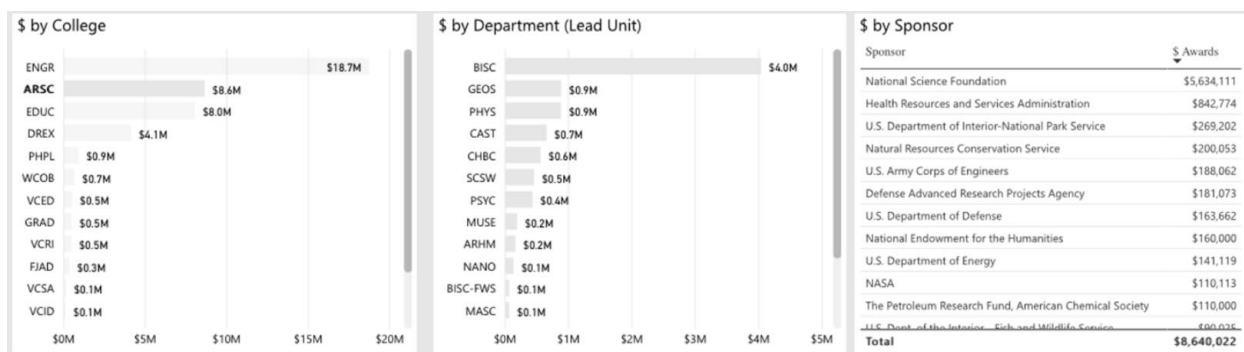
Source: AGI Geoscience Workforce Program, data derived from AGI/AGU Survey of New Geoscience PhDs, Class of 2006.

## G. Research Activity

At the time of writing, the GEOS department had about one million dollars in funded research, placing us second in the Fulbright College of Arts and Sciences. Funding agencies include NSF, USGS and American Chemical Society (ACS). Top funded researchers over the one-year period are Suarez, Boss, Sharman, and Hays.

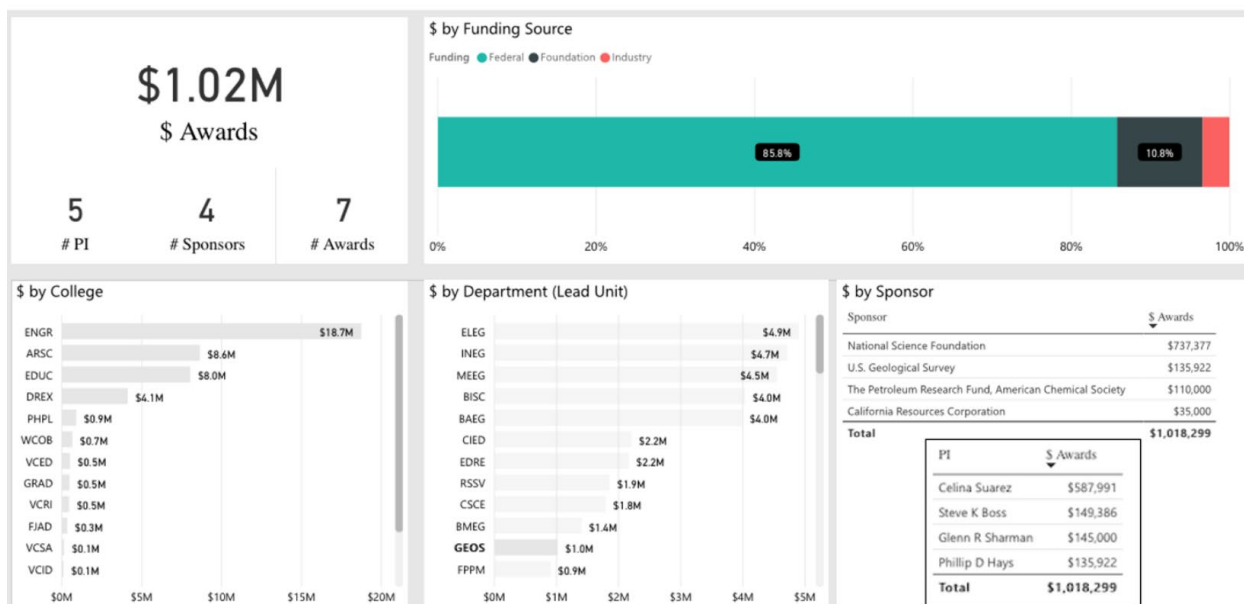
Fulbright College (ARSC) in 2019 had \$8.6M in funded research. Of the 19 ARSC departments Geosciences (GEOS) was tied with Physics for second in the college with about \$1M. Top

funded researchers in GEOS for 2019 were Suarez, Boss, Sharman and Hays. Sharman operates the first industrial consortium in department history, and one of the first in ARSC.



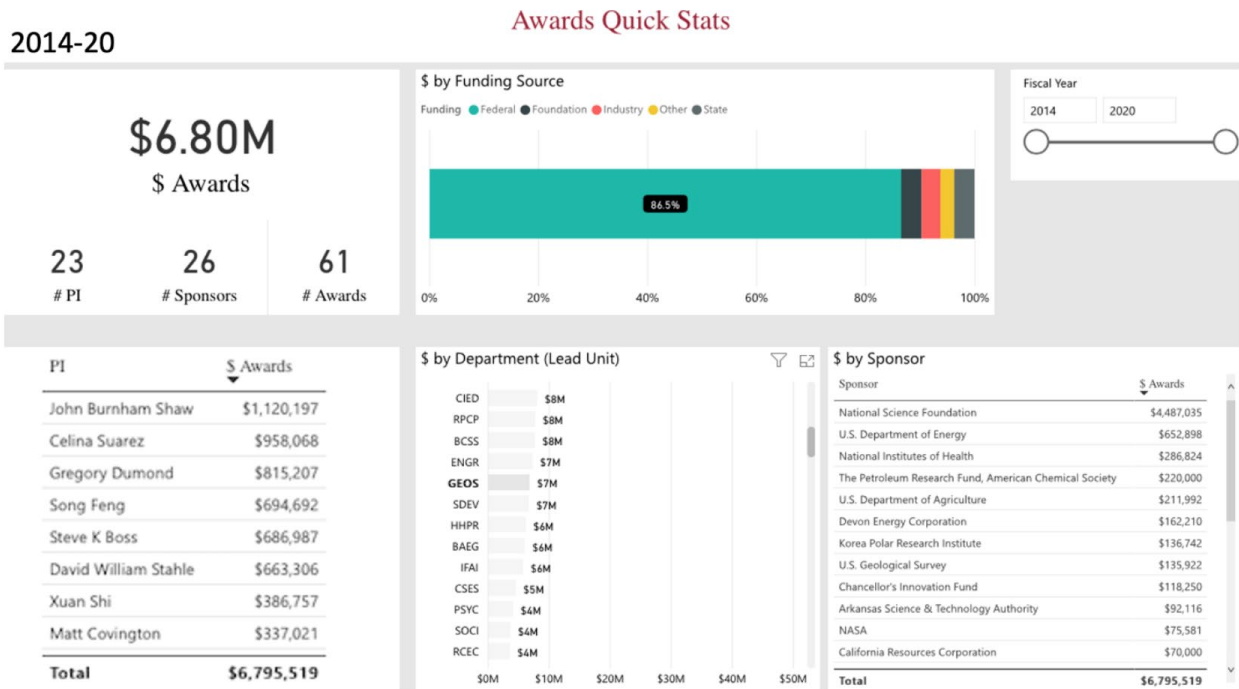
2019

Awards Current Fiscal Year



Over the period 2014-20, GEOS had \$6.8M in funded research from NSF, DOE, NIH, ACS, US Department of Agriculture and others. Top funded researchers in this period are Shaw, Suarez, Dumond, Feng, Boss, Stahle, Shi (resigned 2018), and Covington.





Research objectives for faculty

- *compete for external funding*
- *contribute to (inter)national conferences and meetings*
- *publish in high-impact peer-reviewed journals*
- *supervise graduate and honors students*
- *support graduate students with external funds*
- *pursue (inter)national collaborations*
- *encourage academically-gifted students to engage in independent research*

**X. Conclusion**

**Strengths of the Program**

The long-standing strengths include teaching and mentoring of students both at the undergrad and grad level. The Department can take pride in helping students from backgrounds that do not include excellent academic preparation or good economic standing achieve their potentials and enter into successful careers that benefit the State and society at large. The Department has also been successful over the long term in maintaining multiple viable program thrusts--teaching, mentoring, and research in both the traditional petroleum and resource-evaluation as well as environmental/hydrogeology/surface processes; having this degree of breadth is difficult for a smaller university, but UA Geosciences has done it well. I would note that the aforementioned

strength includes the contributions of our geography side. UA Geosciences is one example of merged departments across the nation where the whole is greater than the sum of the parts, though not without our challenges in achieving this.

- Dedicated leadership, faculty, and staff
- Collegiality; good interrelationships among faculty with a new diversified pool of people coming in over the last few years; supportive atmosphere at all levels (faculty to undergrad); respect of all individuals and viewpoints
- Admin team that is efficient, knowledgeable, and fulfill job duties wonderfully
- Young vibrant faculty that are ambitious and successful in research
- High quality instruction
- Department is very active in service to professional societies and federal agencies
- Relatively diverse compared to other US geoscience departments
- Strong and improving placements of undergraduates in competitive graduate programs; care about student success
- Inter-faculty research collaborations
- Integration of two distinct disciplines as a cohesive whole;
- Research clusters (e.g., surface processes, climate, GIScience, stratigraphy)

### **Challenges the Program Has Addressed Over the Past Two Years**

The department has diversified our program in a number of ways, and this has helped students acquire a broad range of geoscientific skills and knowledge. This is needed to help them be adaptable and fit into many different types of careers. Part of their challenge upon leaving UA will be how successful they are at quickly adapting to new geoscientific problems and having a broad understanding of their discipline. One of the biggest challenges we have had as faculty, has been with helping our students become more quantitative and getting our faculty to use a coherent set of quantitative set of tools throughout their UA education which through continual use in courses, labs and research, that enables them to graduate as experts with these necessary skill sets. This is still a work in progress but in the past two years we have come a long way on this front of modernizing our program.

- Quick and efficient transition to online classes. Addressing (or planning to address) the challenges that will arise due to Covid-19 for both faculty and students
- The department has managed faculty retirements and hiring well with outstanding new hires that will ensure the overall progress and continued success of the department into the future for several decades.
- Drop in geology field camp numbers, reimagining field camp for the 21<sup>st</sup> century
- Increasing the proportion of extremely well-prepared MS and PhD candidates
- Increase in diversity of faculty hires

- Transition of administrative staff and procedures.
- Shortage of faculty to teach classes (e.g., number of offerings as well as support for OCDA)
- TA and RA stipends below regional average supplemented by department scholarships

### **Program Improvements Accomplished Over the Past Two Years**

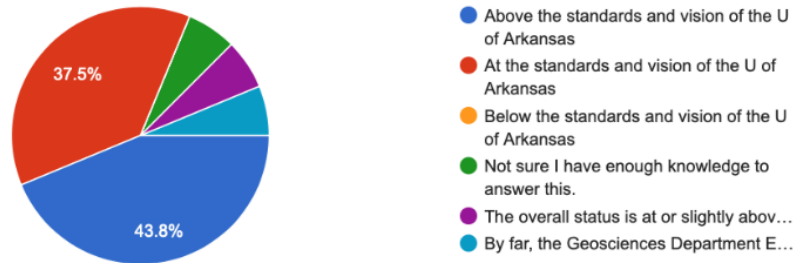
The department showed sensitivity to issues of diversity and intersecting issues of harassment. The department adopted codes of conduct and safety plans for field camp and field activities and established a diversity committee to draft a comprehensive diversity plan to enact going forward. These steps will help broaden participation and promote diverse outlooks and viewpoints that will strengthen the research and teaching successes of the department.

- Made changes to MS and PhD programs in consultation with students. PhD examination guidelines clarified.
- Annual GeoHog research conference has been formalized and strengthened.
- Diversity in hiring: gender, ethnicity, age, background
- Made needed revisions to BS geology program.
- Annual prospective student weekend; increased quality of graduate students recruited
- Improved relationship to alumni, donors, and external advisory board
- Several successful faculty hires
- Increased participation of undergraduates in research and number of research projects
- Quicker response to issues, display case installation, better use and improvement of facilities and resources
- Strong external advisory board that helps navigate campus administrative challenges

In a recent Geosciences Department faculty poll, over 85% responded that the department was at or above the standards and vision of the university as a whole.

In your opinion, the Geosciences department is

16 responses



### Planned Program Improvements

1. Work with administration to increase the number of central-funded PhD TA lines
2. Revise Earth Science BS degree program to align with career and post-graduate education opportunities; add capstone course
3. Improve recruiting and retention of undergrad and graduate students, particularly students that do not identify as the classic geology type; recruiting honors
4. Improve undergraduate research experience and honors participation
5. Discuss, clarify, and revise teaching load adjustments based on large class size, service load, upper level lab courses, and research buyouts. Research active faculty feel 2-2 is out of line with other institutions and some other departments at UA
6. Implement exit interview for students at all levels to gain insight to program strengths and weaknesses, as well as alignment with career opportunities
7. Develop mission and vision statement with input from faculty, students and staff

### Growth of the Phd Program

The Geosciences PhD Program has grown rapidly since its founding in 2013 (see graph below). In the initial years (2013-2016), the growth was primarily tied to filling the nine PhD TA slots specified by the program charter. Since 2017, all growth in active PhD numbers (yellow dashed line) has been through increasing grant support funding Research Assistantships. The number of PhD Teaching Assistant lines has not increased (blue dashed line), meaning that only ~2 students are admitted primarily with TA support each year.

The support level for PhD students is also low, with a base package of \$14,500/9 mo. Position. Students are also responsible for roughly \$1000 in fees and 30% of their health insurance. Compare this to a small selection of peer institutions:

For this reason, great favor is given to students that are competitive for the Graduate School's Distinguished Doctoral Fellowship and Doctoral Academy Fellowship, which boost total student support to \$37,500 and \$27,500 per year, and the department has received 13 such awards since 2013, a strong number compared with other departments. The primary requirements for these fellowships are strong GRE scores (particularly in writing) and GPA, which selects for a narrow

set of applicants. The department has recently directed scholarship money so that PhD TAs without DAF/DDF support receive ~\$4000 per year, increasing the competitiveness of offers.

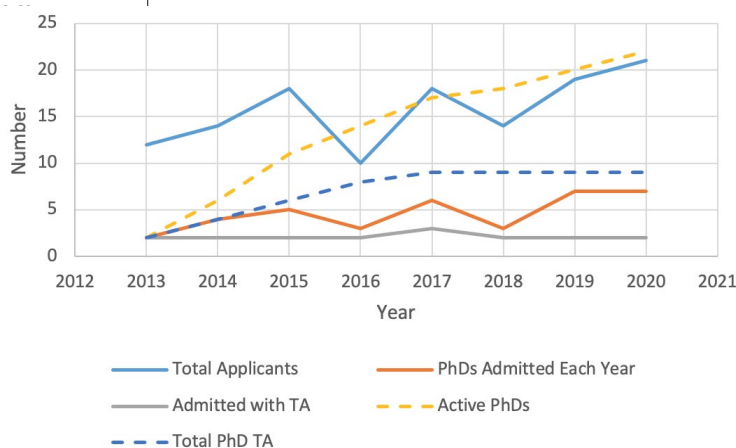
The scarcity of TA support has led to difficult choices for the department about who to make initial offers to. We generally favor students who are competitive for DAF/DDF support, but these often apply to work with more established faculty. The eight Assistant Professors in the department, three had zero PhD support in building their programs (Drs. Holland, Fernandes, Huang), and an additional two have received 2 years of TA support or less (Drs. Marshall, Befus).

Institution	Years of funding	Stipend	Fees
IU	5/4	\$18,000	~ \$800
Illinois-UC	4/4	\$19,000	\$500
Minnesota	5/4	\$18,626	\$800 - \$1000
Michigan State	5	\$20,790	Department pays
Ohio State	6/4	\$18,000	\$550
Wisconsin	5/3	\$20,500	\$1

While funding is always scarce, the GEOS PhD program's growth has been limited in both quality and quantity by the limited number of TA lines and their below market compensation.

The figure below shows a Geosciences

Department PhD GA timeline since inception of the program. Blue cells are TA lines with numbers summing up to 9 for each term, the number of TA lines we have in the department. Yellow cells are students on soft money through faculty research funding.



Initially the 9 PhD TA lines were all central-funded, but by agreement between UA Chancellor Gearhart and the GEOS External Advisory Board the Board was tasked with raising funds to cover 2 of the 9 TA lines. That task was completed in 2018 leaving the department with 7 central funded PhD TA lines. In fall 2020 there will be 21 total PhD students in our department, with 14/21 on soft money.

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GEOS PHD		now next																								Advisor	Funding		
Start Sem	hd Geoscience GA Deg	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023		2024				2025	
	Name	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F	Sp	F
F13	MS Bello, Elvis				CE					1	1																		
F13	MS Yamamura, Daigo									2	2																		
F14	MS Cooper, Max									3	3	1	1																
F14	MS Giannakis, Panos									4	4																		
F14	MS Howard, Ian	DDF								5	5	2	2	1															
F14	MS Torbenson, Max																												
F15	MS Aboaba, Olanrewaju																												
F15	MS Blackstock, Joshua	DAF								6	6	3	3	2	2														
F15	BS Wilson, Bradley	DDF																											
F16	MS Linck, Rachel	DAF								7	7	4	4	3	3	2	1	1											
F16	MS Morgan, Kirsty									8	8	5	5	4	4														
F16	BS Sanks, Kelly	DDF								9	9	6	6																
F16	MS Suwihli, Somaia																												
F17	MS Whaley, Timmera									7	7	5	5	3	2	2	1												
F17	BS Menio, Emma	DAF								8	8	6	6	4	3	3	2			CAST									
F17	MS Morris, Noah									9	9	7	7	5	4	4	3												
F17	MS Trunz, Celia																												
F17	MS Guo, Hong																												
F18	MS Dubois, Kalli																												
F18	MS Ahmed, Moamen																												
F18	MS Oberg, Danielle																												
F19	BS Strickland, Ryan	DDF																											
F19	BS Howe, Cassandra	DDF																											
F19	MS Cathcart, Chris																												
F19	MS Corbin, Tanner																												
F19	MS Wyatt, Katherine																												
S20	MS Ali, Jahangir																												
F20	MS Yan, Zhengxiao																												
F20	BS Fekete, Jack	DAF																											
F20	MS Hughes, Cory	DAF																											
F20	MS Richins, John																												
F20	MS Abdulrahman, Khalid																												
F20	MS Joshi, Govind																												

The total number of hard-funded TA lines in GEOS is 25 (6 for GEOGMS, 12 for GEOMS, 7 for GEOPH). We understand that hard-funded TA lines are fundamentally related to student semester credit hours (SSCH) and lab sections of freshman and sophomore courses. By comparison, we note a department in our college with 22 faculty (same as GEOS), similar SSCH, and similar research funding, but 50 central TA lines..

The Geosciences Department understands the difficulty of starting a new PhD program and is thankful to UA administration and the External Advisory Board for support. However, with our accelerating success in funded research (2nd in our college for 2019) we hope consideration will be given toward investing a few more PhD TA lines in our faculty and department.

The cost of adding one PhD TA is approximately \$20,000 representing stipend, benefits, and tuition. GEOS currently has 14 PhD GA lines on soft money bringing \$280,000 annual benefit to UA. Our stretch goal is to restore the 2 central TA lines and add 2 more central lines for a net addition of 4 new central-funded PhD TA lines at an approximate annual cost of \$80,000 leaving \$200,000 net to the university.

**Appendix A. Syllabi for Discipline-Specific Courses**

See separate file named 'Appendix A'

**Appendix B. Program Faculty Information**

See separate file named 'Appendix B'

## Appendix C. Program Data

### C.1. Degrees Awarded

#### Earth Science BS

Program Review: Student Data - Degrees Awarded														
Department of Geosciences														
Earth Science, BS														
Primary Degrees Awarded by Ethnicity and Gender <sup>1</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	1
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Caucasian	3	5	2	4	0	6	1	2	2	1	1	4	4	4
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Two or More Races	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	1	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Total</b>	<b>8</b>		<b>8</b>		<b>7</b>		<b>3</b>		<b>3</b>		<b>5</b>		<b>11</b>	
Primary and Secondary Degrees Awarded by Ethnicity and Gender <sup>2</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	1
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Caucasian	3	5	3	4	0	6	1	2	2	2	2	4	4	4
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Two or More Races	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	1	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Total</b>	<b>8</b>		<b>9</b>		<b>7</b>		<b>3</b>		<b>4</b>		<b>6</b>		<b>11</b>	

Notes: <sup>1</sup>Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).  
<sup>2</sup>Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).  
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.  
Source: AHEIS files - Degrees Awarded.



Geography BA

Program Review: Student Data - Degrees Awarded														
Department of Geosciences														
Geography, BA														
Primary Degrees Awarded by Ethnicity and Gender <sup>1</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	2	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Caucasian	2	5	3	9	3	7	4	5	4	9	3	4	8	6
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	1	0	0	1	0	0	2	1	0	0	0	0
Non-Resident Alien	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>3</b>	<b>6</b>	<b>5</b>	<b>11</b>	<b>3</b>	<b>9</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>10</b>	<b>3</b>	<b>4</b>	<b>8</b>	<b>6</b>
<b>Total</b>	<b>9</b>		<b>16</b>		<b>12</b>		<b>9</b>		<b>16</b>		<b>7</b>		<b>14</b>	
Primary and Secondary Degrees Awarded by Ethnicity and Gender <sup>2</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	2	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Asian	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Caucasian	4	7	4	10	5	9	4	6	4	9	3	4	8	6
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	1	0	0	2	0	0	2	1	0	0	0	0
Non-Resident Alien	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>5</b>	<b>8</b>	<b>6</b>	<b>12</b>	<b>5</b>	<b>12</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>10</b>	<b>3</b>	<b>4</b>	<b>8</b>	<b>6</b>
<b>Total</b>	<b>13</b>		<b>18</b>		<b>17</b>		<b>11</b>		<b>16</b>		<b>7</b>		<b>14</b>	
Notes: <sup>1</sup> Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).														
<sup>2</sup> Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).														
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.														
Source: AHEIS files - Degrees Awarded.														

## Geography MS

Program Review: Student Data - Degrees Awarded														
Department of Geosciences														
Geography, MS														
Primary Degrees Awarded by Ethnicity and Gender <sup>1</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	1	1	0	4	1	5	2	2
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>2</b>	<b>2</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>7</b>	<b>4</b>	<b>4</b>

Primary and Secondary Degrees Awarded by Ethnicity and Gender <sup>2</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	1	1	0	4	1	5	2	2
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>2</b>	<b>2</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>7</b>	<b>4</b>	<b>4</b>

Notes: <sup>1</sup>Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).  
<sup>2</sup>Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).  
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.  
Source: AHEIS files - Degrees Awarded.

## Geology BS

Program Review: Student Data - Degrees Awarded														
Department of Geosciences														
Geology, BS														
Primary Degrees Awarded by Ethnicity and Gender <sup>1</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	1	0	0	0	3	0	0
American Indian or Alaska Native	0	0	0	0	0	1	0	0	1	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	3	12	5	17	4	8	2	14	5	11	9	8	2	10
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	1	0	0	0	0	0	0	0	0	2	0	0	0
Non-Resident Alien	1	0	0	1	1	0	0	1	0	0	0	0	1	0
Two or More Races	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<b>Total by Gender</b>	<b>4</b>	<b>13</b>	<b>5</b>	<b>18</b>	<b>5</b>	<b>10</b>	<b>2</b>	<b>17</b>	<b>7</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>3</b>	<b>11</b>
<b>Total</b>	<b>17</b>		<b>23</b>		<b>15</b>		<b>19</b>		<b>18</b>		<b>22</b>		<b>14</b>	
Primary and Secondary Degrees Awarded by Ethnicity and Gender <sup>2</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	1	0	0	0	3	0	0
American Indian or Alaska Native	0	0	0	0	0	1	0	0	1	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	3	13	5	17	4	8	2	15	5	12	9	8	2	10
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	1	0	0	0	0	0	0	0	0	2	0	0	0
Non-Resident Alien	1	0	0	1	1	0	0	1	0	0	0	0	1	0
Two or More Races	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<b>Total by Gender</b>	<b>4</b>	<b>14</b>	<b>5</b>	<b>18</b>	<b>5</b>	<b>10</b>	<b>2</b>	<b>18</b>	<b>7</b>	<b>12</b>	<b>11</b>	<b>11</b>	<b>3</b>	<b>11</b>
<b>Total</b>	<b>18</b>		<b>23</b>		<b>15</b>		<b>20</b>		<b>19</b>		<b>22</b>		<b>14</b>	
Notes: <sup>1</sup> Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).														
<sup>2</sup> Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).														
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.														
Source: AHEIS files - Degrees Awarded.														

**Geology MS**

<b>Program Review: Student Data - Degrees Awarded</b>														
<b>Department of Geosciences</b>														
<b>Geology, MS</b>														
<b>Primary Degrees Awarded by Ethnicity and Gender<sup>1</sup></b>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	2	0	0	1	1	0	0	1	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	2	4	4	9	4	10	1	11	3	5	0	6	5	7
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Non-Resident Alien	0	1	0	0	0	0	0	1	3	1	0	1	0	1
Two or More Races	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<b>Total by Gender</b>	<b>2</b>	<b>6</b>	<b>6</b>	<b>9</b>	<b>4</b>	<b>11</b>	<b>3</b>	<b>12</b>	<b>6</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>10</b>
<b>Total</b>	<b>8</b>		<b>15</b>		<b>15</b>		<b>15</b>		<b>13</b>		<b>7</b>		<b>16</b>	
<b>Primary and Secondary Degrees Awarded by Ethnicity and Gender<sup>2</sup></b>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	2	0	0	1	1	0	0	1	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	2	4	4	9	4	10	1	11	3	5	0	6	5	7
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Non-Resident Alien	0	1	0	0	0	0	0	1	3	1	0	1	0	1
Two or More Races	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<b>Total by Gender</b>	<b>2</b>	<b>6</b>	<b>6</b>	<b>9</b>	<b>4</b>	<b>11</b>	<b>3</b>	<b>12</b>	<b>6</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>10</b>
<b>Total</b>	<b>8</b>		<b>15</b>		<b>15</b>		<b>15</b>		<b>13</b>		<b>7</b>		<b>16</b>	

Notes: <sup>1</sup>Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).  
<sup>2</sup>Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).  
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.  
Source: AHEIS files - Degrees Awarded.

Geosciences PhD

Program Review: Student Data - Degrees Awarded														
Department of Geosciences														
Geosciences, PhD														
Primary Degrees Awarded by Ethnicity and Gender <sup>1</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	1	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	
Primary and Secondary Degrees Awarded by Ethnicity and Gender <sup>2</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	1	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	

Notes: <sup>1</sup>Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).  
<sup>2</sup>Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).  
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.  
Source: AHEIS files - Degrees Awarded.

### Undergraduate Geospatial Technologies Certificate

Program Review: Student Data - Degrees Awarded														
Department of Geosciences														
Geospatial Technologies, CP														
Primary Degrees Awarded by Ethnicity and Gender <sup>1</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	1	0	0	0	0	2	0	3
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
Primary and Secondary Degrees Awarded by Ethnicity and Gender <sup>2</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	1	0	0	0	0	2	0	3
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>

Notes: <sup>1</sup>Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).  
<sup>2</sup>Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).  
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.  
Source: AHEIS files - Degrees Awarded.

## Graduate Geospatial Technologies Certificate

Program Review: Student Data - Degrees Awarded														
Department of Geosciences														
Geospatial Technologies, GC														
Primary Degrees Awarded by Ethnicity and Gender <sup>1</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Primary and Secondary Degrees Awarded by Ethnicity and Gender <sup>2</sup>														
Race†	Academic Year 2013†		Academic Year 2014†		Academic Year 2015†		Academic Year 2016†		Academic Year 2017†		Academic Year 2018†		Academic Year 2019†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

Notes: <sup>1</sup>Degree totals in this section include only the primary major of the degrees (so a student graduating with a double major will appear only in the count of the primary major).  
<sup>2</sup>Degree totals in this section include both primary, secondary and tertiary majors of the degree (so a student graduating with a double major will appear in the counts of both majors).  
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.  
Source: AHEIS files - Degrees Awarded.



C.2 Faculty FTE Data Historical and Current

Program Review: Faculty <sup>1</sup> Data																				
Department of Geosciences																				
Academic Year 2013 (Fall 2012 Snapshot)																				
	American Indian or Alaskan		Asian or Pacific Islander <sup>2</sup>		Black Non-Hispanic		Hispanic <sup>3</sup>		Hawaiian or Pacific Islander <sup>3</sup>		Two or More Races <sup>3</sup>		Non-Resident Alien		Unknown		White Non-Hispanic		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Tenure / Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assistant Professor	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	5	2
Associate Professor	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4	1
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	1	7	1	
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>14</b>	<b>3</b>	<b>19</b>	<b>4</b>	
FTE: 22.5																				
<b>Not on Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	1	2	3	0
Assistant Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>
FTE: 4.5																				

Source: Employee Report File

<sup>1</sup> Includes all personnel who were assigned to this academic department within BASIS, identified as faculty, and whose percent of salary ≥ 50% instruction and/or research. Note that faculty with title modifiers are reported in-rank here, but are moved to instructor or lecturer for most reporting purposes.

<sup>2</sup> FTE definition: Appointment percent divided by 100

<sup>3</sup> Beginning with FY2010, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories.

Accordingly, year to date comparisons are not available.

Academic Year 2014 (Fall 2013 Snapshot)																				
	American Indian or Alaskan		Asian or Pacific Islander <sup>2</sup>		Black Non-Hispanic		Hispanic <sup>3</sup>		Hawaiian or Pacific Islander <sup>3</sup>		Two or More Races <sup>3</sup>		Non-Resident Alien		Unknown		White Non-Hispanic		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Tenure / Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assistant Professor	0	0	2	0	0	0	0	0	0	0	1	1	1	0	0	2	0	5	2	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3	1	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	1	6	1	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>13</b>	<b>2</b>	<b>17</b>	<b>4</b>	<b>0</b>
FTE: 20.5																				
<b>Not on Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Instructor	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	1	2	0
Assistant Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>0</b>
FTE: 3.5																				



U Arkansas Department of Geosciences Self-Study Report 2020

Academic Year 2015 (Fall 2014 Snapshot)																				
	American Indian or Alaskan		Asian or Pacific Islander <sup>2</sup>		Black Non-Hispanic		Hispanic <sup>3</sup>		Hawaiian or Pacific Islander <sup>4</sup>		Two or More Races <sup>5</sup>		Non-Resident Alien		Unknown		White Non-Hispanic		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Tenure / Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assistant Professor	0	0	2	0	0	0	0	0	0	0	0	1	1	1	1	0	2	0	6	2
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3	1
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	1	6	1
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>13</b>	<b>2</b>	<b>18</b>	<b>4</b>
FTE: 21																				
<b>Not on Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Instructor	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	2
Assistant Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>
FTE: 3.5																				

Academic Year 2016 (Fall 2015 Snapshot)																				
	American Indian or Alaskan		Asian or Pacific Islander <sup>2</sup>		Black Non-Hispanic		Hispanic <sup>3</sup>		Hawaiian or Pacific Islander <sup>4</sup>		Two or More Races <sup>5</sup>		Non-Resident Alien		Unknown		White Non-Hispanic		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Tenure / Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assistant Professor	0	0	2	0	0	0	0	0	0	0	0	1	1	1	1	0	2	0	6	2
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3	1
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	1	6	1
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>13</b>	<b>2</b>	<b>18</b>	<b>4</b>
FTE: 21																				
<b>Not on Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1
Instructor	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2
Assistant Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>
FTE: 3.75																				

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Academic Year 2017 (Fall 2016 Snapshot)																				
	American Indian or Alaskan		Asian or Pacific Islander <sup>2</sup>		Black Non-Hispanic		Hispanic <sup>3</sup>		Hawaiian or Pacific Islander <sup>4</sup>		Two or More Races <sup>5</sup>		Non-Resident Alien		Unknown		White Non-Hispanic		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Tenure / Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assistant Professor	0	0	2	0	0	0	0	0	0	0	0	1	1	0	1	1	3	0	7	2
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	1
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>13</b>	<b>1</b>	<b>17</b>	<b>3</b>
FTE: 20																				
<b>Not on Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2
Assistant Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>
FTE: 3																				

Academic Year 2018 (Fall 2017 Snapshot)																				
	American Indian or Alaskan		Asian or Pacific Islander <sup>2</sup>		Black Non-Hispanic		Hispanic <sup>3</sup>		Hawaiian or Pacific Islander <sup>4</sup>		Two or More Races <sup>5</sup>		Non-Resident Alien		Unknown		White Non-Hispanic		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Tenure / Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assistant Professor	0	0	2	0	0	0	0	0	0	0	0	1	1	0	2	2	3	0	8	3
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>14</b>	<b>1</b>	<b>19</b>	<b>4</b>
FTE: 23																				
<b>Not on Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Instructor	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2
Assistant Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>
FTE: 3.25																				

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Academic Year 2019 (Fall 2018 Snapshot)																				
	American Indian or Alaskan		Asian or Pacific Islander <sup>2</sup>		Black Non-Hispanic		Hispanic <sup>3</sup>		Hawaiian or Pacific Islander <sup>4</sup>		Two or More Races <sup>5</sup>		Non-Resident Alien		Unknown		White Non-Hispanic		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<b>Tenure / Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instructor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assistant Professor	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2	2	1	0	4	3
Associate Professor	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	1	3	2
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>11</b>	<b>1</b>	<b>15</b>	<b>5</b>
FTE: 20																				
<b>Not on Tenure Track</b>																				
Lecturer	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	
Instructor	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	1	3
Assistant Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Associate Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished Professor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Departmental Chairperson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>5</b>	
FTE: 4.75																				

C.3. Detailed Enrollment Breakdown

Department of Geosciences														
Earth Science, BS														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	1	0	1
American Indian or Alaska Native	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	1	0	2	0
Caucasian	12	20	8	11	6	9	7	9	13	10	15	16	14	11
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	0	1	1	2	1	0	0	0	0	0	1	2	1
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Two or More Races	1	0	0	1	0	0	1	0	1	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	1	0	1	0	2	0
<b>Total by Gender</b>	<b>14</b>	<b>20</b>	<b>9</b>	<b>14</b>	<b>8</b>	<b>11</b>	<b>8</b>	<b>9</b>	<b>15</b>	<b>10</b>	<b>17</b>	<b>18</b>	<b>20</b>	<b>14</b>
<b>Total</b>	<b>34</b>		<b>23</b>		<b>19</b>		<b>17</b>		<b>25</b>		<b>35</b>		<b>34</b>	
Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	1	0	1
American Indian or Alaska Native	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	1	0	2	0
Caucasian	14	22	10	11	7	14	8	10	16	11	15	18	14	12
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	0	1	1	2	1	0	0	0	0	0	1	2	1
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Two or More Races	1	0	0	1	0	0	1	0	1	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	1	0	1	0	2	0
<b>Total by Gender</b>	<b>16</b>	<b>22</b>	<b>11</b>	<b>14</b>	<b>9</b>	<b>16</b>	<b>9</b>	<b>10</b>	<b>18</b>	<b>11</b>	<b>17</b>	<b>20</b>	<b>20</b>	<b>15</b>
<b>Total</b>	<b>38</b>		<b>25</b>		<b>25</b>		<b>19</b>		<b>29</b>		<b>37</b>		<b>35</b>	

Notes: <sup>1</sup>Enrollment totals in this section include all students with this degree program as their primary major.  
<sup>2</sup>Enrollment totals in this section include all students with this degree program as their primary or secondary major.  
† Beginning with Summer II 2009, race and ethnicity details are being collected in a method amenable to the new federal race and ethnicity reporting categories. Accordingly, year to date comparisons are not available.  
Source: AHEIS files Enrollment by Majors (On-and Off-Schedule, On-and Off-Campus).

Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	1	0	1	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Asian	1	0	1	1	0	0	0	0	1	0	0	0	0	0
Caucasian	3	23	7	25	14	20	14	16	9	16	5	13	6	17
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	1	1	2	2	1	2	1	2	1	1	0	1	1
Non-Resident Alien	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Two or More Races	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	1	0	1	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>6</b>	<b>26</b>	<b>9</b>	<b>30</b>	<b>17</b>	<b>22</b>	<b>16</b>	<b>17</b>	<b>12</b>	<b>18</b>	<b>6</b>	<b>13</b>	<b>8</b>	<b>18</b>
<b>Total</b>	<b>32</b>		<b>39</b>		<b>39</b>		<b>33</b>		<b>30</b>		<b>19</b>		<b>26</b>	
Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	1	0	1	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Asian	1	0	1	1	0	0	0	0	1	0	1	0	2	0
Caucasian	6	29	10	28	18	22	17	17	14	17	9	13	10	21
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	1	1	3	2	2	2	2	2	1	1	0	1	2
Non-Resident Alien	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Two or More Races	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	1	0	1	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>9</b>	<b>32</b>	<b>12</b>	<b>34</b>	<b>21</b>	<b>25</b>	<b>20</b>	<b>19</b>	<b>17</b>	<b>19</b>	<b>11</b>	<b>13</b>	<b>14</b>	<b>23</b>
<b>Total</b>	<b>41</b>		<b>46</b>		<b>46</b>		<b>39</b>		<b>36</b>		<b>24</b>		<b>37</b>	

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Geography, MA (Deleted)														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	1	0	1	1	0	1	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	6	15	6	11	5	12	2	13	1	3	1	0	0	0
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	1	1	1	1	1	0	2	0	2	0	1	0	0
Non-Resident Alien	1	1	1	3	0	3	0	1	0	1	0	0	0	0
Two or More Races	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Unknown	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>8</b>	<b>18</b>	<b>10</b>	<b>15</b>	<b>8</b>	<b>17</b>	<b>2</b>	<b>17</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Total</b>	<b>26</b>	<b>25</b>	<b>25</b>	<b>19</b>	<b>7</b>	<b>2</b>	<b>0</b>							

Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	1	0	1	1	0	1	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	6	15	6	11	5	13	3	14	1	3	1	0	0	0
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	1	1	1	1	1	1	2	0	2	0	1	0	0
Non-Resident Alien	1	1	1	3	0	3	0	1	0	1	0	0	0	0
Two or More Races	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Unknown	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>8</b>	<b>18</b>	<b>10</b>	<b>15</b>	<b>8</b>	<b>18</b>	<b>4</b>	<b>18</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Total</b>	<b>26</b>	<b>25</b>	<b>26</b>	<b>22</b>	<b>7</b>	<b>2</b>	<b>0</b>							

Geography, MS														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Caucasian	0	0	0	0	0	0	1	1	5	10	5	6	3	4
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Non-Resident Alien	0	0	0	0	0	0	0	0	0	1	0	2	0	1
Two or More Races	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>11</b>	<b>8</b>	<b>9</b>	<b>6</b>	<b>6</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>16</b>	<b>17</b>	<b>12</b>				

Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Caucasian	0	0	0	0	0	0	1	1	6	11	6	6	3	4
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Non-Resident Alien	0	0	0	0	0	0	0	0	0	1	0	2	0	1
Two or More Races	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>12</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>6</b>
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>18</b>	<b>18</b>	<b>12</b>				

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Geology, BS														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	1	0	0	1	0	3	0	4	0	3	0	2
American Indian or Alaska Native	0	1	1	2	1	0	1	1	1	1	0	1	0	0
Asian	0	0	0	0	1	0	2	0	2	1	2	1	2	0
Caucasian	16	48	19	44	22	57	26	58	24	43	19	36	12	26
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	2	1	0	1	0	1	2	1	3	2	1	3	1	4
Non-Resident Alien	0	1	2	1	1	1	0	0	1	2	1	2	1	1
Two or More Races	1	1	1	2	0	1	0	1	0	1	1	2	3	3
Unknown	0	0	1	0	1	0	1	0	1	1	0	0	0	1
<b>Total by Gender</b>	<b>19</b>	<b>52</b>	<b>25</b>	<b>50</b>	<b>26</b>	<b>61</b>	<b>32</b>	<b>64</b>	<b>32</b>	<b>55</b>	<b>24</b>	<b>48</b>	<b>19</b>	<b>37</b>
<b>Total</b>	<b>71</b>		<b>75</b>		<b>87</b>		<b>96</b>		<b>87</b>		<b>72</b>		<b>56</b>	

Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	1	0	0	1	0	3	0	4	0	3	0	2
American Indian or Alaska Native	0	1	1	2	1	0	1	1	1	1	0	1	0	0
Asian	0	0	0	0	1	0	2	0	2	1	2	1	2	0
Caucasian	17	49	20	45	22	58	26	59	25	43	20	37	13	26
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	2	1	0	1	0	1	2	1	3	2	1	3	1	4
Non-Resident Alien	0	2	2	1	1	1	0	0	1	2	1	2	1	1
Two or More Races	1	1	1	2	0	1	0	1	0	1	1	2	3	3
Unknown	0	0	1	0	1	0	1	0	1	1	0	0	0	1
<b>Total by Gender</b>	<b>20</b>	<b>54</b>	<b>26</b>	<b>51</b>	<b>26</b>	<b>62</b>	<b>32</b>	<b>65</b>	<b>33</b>	<b>55</b>	<b>25</b>	<b>49</b>	<b>20</b>	<b>37</b>
<b>Total</b>	<b>74</b>		<b>77</b>		<b>88</b>		<b>97</b>		<b>88</b>		<b>74</b>		<b>57</b>	

Geology, MS														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	2	0	1	1	1	2	1	1	0	1	0	1	0	1
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	6	22	8	32	9	33	9	30	7	25	3	19	5	12
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	0	0	0	0	0	1	0	1	0	0	0	1	1
Non-Resident Alien	0	1	1	2	3	3	3	2	1	4	0	4	0	2
Two or More Races	0	0	0	0	0	0	0	0	0	1	0	4	0	3
Unknown	0	0	0	0	0	0	0	0	0	0	1	0	1	1
<b>Total by Gender</b>	<b>9</b>	<b>23</b>	<b>10</b>	<b>35</b>	<b>13</b>	<b>38</b>	<b>13</b>	<b>34</b>	<b>8</b>	<b>32</b>	<b>4</b>	<b>28</b>	<b>7</b>	<b>20</b>
<b>Total</b>	<b>32</b>		<b>45</b>		<b>51</b>		<b>47</b>		<b>40</b>		<b>32</b>		<b>27</b>	

Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	2	0	1	1	1	2	1	1	0	1	0	1	0	1
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	6	22	8	32	9	33	9	30	8	25	4	20	6	12
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	1	0	0	0	0	0	1	0	1	0	0	0	1	1
Non-Resident Alien	0	1	1	2	3	3	3	2	1	4	0	4	0	2
Two or More Races	0	0	0	0	0	0	0	0	0	1	0	4	0	3
Unknown	0	0	0	0	0	0	0	0	0	0	1	0	1	1
<b>Total by Gender</b>	<b>9</b>	<b>23</b>	<b>10</b>	<b>35</b>	<b>13</b>	<b>38</b>	<b>13</b>	<b>34</b>	<b>9</b>	<b>32</b>	<b>5</b>	<b>29</b>	<b>8</b>	<b>20</b>
<b>Total</b>	<b>32</b>		<b>45</b>		<b>51</b>		<b>47</b>		<b>41</b>		<b>34</b>		<b>28</b>	

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Geosciences, PHD														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	1	1	1	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	2	0	4	2	4	4	5	5	5
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Non-Resident Alien	1	0	0	2	0	4	1	7	2	6	4	4	4	5
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>2</b>	<b>11</b>	<b>4</b>	<b>10</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Total</b>	<b>1</b>		<b>2</b>		<b>6</b>		<b>13</b>		<b>14</b>		<b>19</b>		<b>20</b>	

Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	1	1	1	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	2	0	4	2	4	4	5	5	5
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Non-Resident Alien	1	0	0	2	0	4	1	7	2	6	4	4	4	5
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>2</b>	<b>11</b>	<b>4</b>	<b>10</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Total</b>	<b>1</b>		<b>2</b>		<b>6</b>		<b>13</b>		<b>14</b>		<b>19</b>		<b>20</b>	

Geospatial Technologies, CP														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Caucasian	0	0	0	0	2	3	3	4	2	5	2	4	2	2
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	1	0	1	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	1	1	0	0	0	0	1	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>2</b>
<b>Total</b>	<b>0</b>		<b>0</b>		<b>6</b>		<b>9</b>		<b>9</b>		<b>7</b>		<b>5</b>	

Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Caucasian	0	0	0	0	2	3	3	4	2	5	2	4	2	2
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	1	0	1	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	1	1	0	0	0	0	1	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>2</b>
<b>Total</b>	<b>0</b>		<b>0</b>		<b>6</b>		<b>9</b>		<b>9</b>		<b>7</b>		<b>5</b>	



U Arkansas Department of Geosciences Self-Study Report 2020

Geospatial Technologies, GC														
Fall Enrollment by Primary Major <sup>1</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	0	0	0	0	2	1	0	1
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>Total</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>3</b>		<b>1</b>	
Fall Enrollment by Primary and Secondary Major <sup>2</sup>														
Race†	Fall 2012†		Fall 2013†		Fall 2014†		Fall 2015†		Fall 2016†		Fall 2017†		Fall 2018†	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
African American	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caucasian	0	0	0	0	0	0	0	0	0	0	2	1	0	1
Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic and any other race	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Alien	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two or More Races	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total by Gender</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>Total</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>3</b>		<b>1</b>	



C.4. Average Class Size

Program Review: Class Data - Average Organized Class Size																				
Department of Geosciences																				
Academic Year 2013 - 2014																				
Semester	Undergraduate Classes									Graduate Classes										
	Lower Level			Upper Level			Graduate Level													
	1xxx	2xxx	Average	3xxx	4xxx	Average	5xxx	6xxx	7xxx	Average										
	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>										
Summer II	27	4	0	0	27	4	14	1	0	0	14	1	0	0	0	0	0	0		
Fall	41	56	92	3	43	59	28	6	22	12	24	18	19	6	11	2	0	0	17	8
Spring	40	48	180	1	43	49	30	6	19	15	22	21	11	6	6	1	0	0	10	7
Summer I	12	3	0	0	12	3	10	1	42	1	26	2	0	0	0	0	0	0	0	0
<b>Academic Year Average</b>	<b>39</b>	<b>111</b>	<b>114</b>	<b>4</b>	<b>42</b>	<b>115</b>	<b>27</b>	<b>14</b>	<b>21</b>	<b>28</b>	<b>23</b>	<b>42</b>	<b>15</b>	<b>12</b>	<b>9</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>15</b>

Data included are based on information in the student information system (SAFARI/ISIS) as of the 11th class day for fall and spring terms and the 5th class day for summer terms.

<sup>1</sup> Avg is the average number of students per class  
<sup>2</sup> N is the number of classes

Source: AHEIS Files (On- and Off-Schedule, On- and Off-Campus).

Academic Year 2014 - 2015																				
Semester	Undergraduate Classes									Graduate Classes										
	Lower Level			Upper Level			Graduate Level													
	1xxx	2xxx	Average	3xxx	4xxx	Average	5xxx	6xxx	7xxx	Average										
	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>										
Summer II	18	4	0	0	18	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fall	38	51	71	2	40	53	17	11	18	11	17	22	15	8	9	2	0	0	14	10
Spring	41	47	76	1	42	48	19	11	19	14	19	25	9	8	7	1	0	0	9	9
Summer I	8	3	0	0	8	3	0	0	49	1	49	1	0	0	0	0	0	0	0	0
<b>Academic Year Average</b>	<b>38</b>	<b>105</b>	<b>73</b>	<b>3</b>	<b>39</b>	<b>108</b>	<b>18</b>	<b>22</b>	<b>20</b>	<b>26</b>	<b>19</b>	<b>48</b>	<b>12</b>	<b>16</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>19</b>

Academic Year 2015 - 2016																				
Semester	Undergraduate Classes									Graduate Classes										
	Lower Level			Upper Level			Graduate Level													
	1xxx	2xxx	Average	3xxx	4xxx	Average	5xxx	6xxx	7xxx	Average										
	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>	Avg <sup>1</sup> N <sup>2</sup>										
Summer II	11	4	0	0	11	4	1	1	0	0	1	1	0	0	0	0	0	0	0	0
Fall	34	48	69	3	36	51	17	10	16	10	16	20	8	17	10	2	0	0	8	19
Spring	42	42	68	2	43	44	19	9	13	15	15	24	8	17	4	1	0	0	8	18
Summer I	9	3	0	0	9	3	0	0	33	1	33	1	0	0	0	0	0	0	0	0
<b>Academic Year Average</b>	<b>36</b>	<b>97</b>	<b>68</b>	<b>5</b>	<b>37</b>	<b>102</b>	<b>17</b>	<b>20</b>	<b>15</b>	<b>26</b>	<b>16</b>	<b>46</b>	<b>8</b>	<b>34</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>37</b>

Academic Year 2016 - 2017																		
Semester	Undergraduate Classes									Graduate Classes								
	Lower Level					Upper Level				Graduate Level								
	1xxx		2xxx		Average	3xxx		4xxx		Averag	5xxx		6xxx		7xxx		Averag	
	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>
Summer II	13	4	0	0	13	4	0	0	0	0	0	0	0	0	0	0	0	0
Fall	41	52	56	3	42	55	17	11	17	9	17	20	8	21	0	0	0	0
Spring	44	47	94	1	45	48	20	10	12	14	15	24	6	26	0	0	0	0
Summer I	13	3	0	0	13	3	0	0	23	1	23	1	0	0	0	0	0	0
<b>Academic Year Average</b>	<b>40</b>	<b>106</b>	<b>65</b>	<b>4</b>	<b>41</b>	<b>110</b>	<b>18</b>	<b>21</b>	<b>14</b>	<b>24</b>	<b>16</b>	<b>45</b>	<b>7</b>	<b>47</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Academic Year 2017 - 2018																		
Semester	Undergraduate Classes									Graduate Classes								
	Lower Level					Upper Level				Graduate Level								
	1xxx		2xxx		Average	3xxx		4xxx		Averag	5xxx		6xxx		7xxx		Averag	
	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>
Summer II	17	4	0	0	17	4	0	0	0	0	0	0	0	0	0	0	0	0
Fall	42	59	59	3	43	62	15	11	11	13	13	24	5	23	9	1	0	0
Spring	46	47	96	1	47	48	21	9	13	13	16	22	5	24	6	1	0	0
Summer I	11	3	0	0	11	3	0	0	26	1	26	1	0	0	0	0	0	0
<b>Academic Year Average</b>	<b>42</b>	<b>113</b>	<b>69</b>	<b>4</b>	<b>43</b>	<b>117</b>	<b>18</b>	<b>20</b>	<b>13</b>	<b>27</b>	<b>15</b>	<b>47</b>	<b>5</b>	<b>47</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>

Academic Year 2018 - 2019																		
Semester	Undergraduate Classes									Graduate Classes								
	Lower Level					Upper Level				Graduate Level								
	1xxx		2xxx		Average	3xxx		4xxx		Averag	5xxx		6xxx		7xxx		Averag	
	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>	Avg <sup>1</sup>	N <sup>2</sup>
Summer II	15	2	0	0	15	2	0	0	0	0	0	0	0	0	0	0	0	0
Fall	41	53	51	4	41	57	21	9	11	11	15	20	6	20	7	1	0	0
Spring	43	49	66	2	44	51	17	11	13	14	14	25	5	23	0	0	0	0
Summer I	14	3	0	0	14	3	0	0	17	1	17	1	0	0	0	0	0	0
<b>Academic Year Average</b>	<b>40</b>	<b>107</b>	<b>56</b>	<b>6</b>	<b>41</b>	<b>113</b>	<b>19</b>	<b>20</b>	<b>12</b>	<b>26</b>	<b>15</b>	<b>46</b>	<b>6</b>	<b>43</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>

### Calculation of Average Class Size

Average enrollment in organized classes (see definition in Appendix C) is calculated by course level for each program and includes classes with any number of students enrolled ( $n \geq 1$ ). Only credit-bearing courses are included. When courses for the entire department are included in the review, classes are selected by using the department code. Course prefix (alpha code) is used to select classes when the program is interdisciplinary or is a subsidiary program within a department.

### Course Level

In this section of the report, course level is determined by the first digit of the course or “catalog” number, irrespective of the level of the students enrolled. For instance, the entire enrollment in

ACCT 4963 is considered Level 4 (senior), even if a few graduate students take that class for graduate credit.

### **Levels**

- Lower Level: the average enrollment of Level 1 (freshman) and Level 2 (sophomore) combined.
- Level 1 includes course numbers which begin with 0 or 1, such as MATH 0003 and COMM 1313.
- Level 2 includes course numbers beginning with 2.
- Upper Level: the average enrollment of Level 3 (junior) and Level 4 (senior) combined.
- Graduate Level: the average enrollment of Level 5, Levels 6 and Level 7.

These levels may not match perfectly with the SSCH documents as the ‘Graduate Level’ here refers only to the course number. If there are graduate students enrolled in a 4000 level course, they would be counted in the ‘Upper Level’ for Average Class Size but their SSCH captured at the graduate level for SSCH calculations.

### **Combined Classes**

Within one classroom, there may be students who have registered for separate offerings or versions of that class. Some students register under the offering which awards undergraduate credit, and others for graduate credit, for example. Cross-listed (equivalent) courses may also be taught together. For this report, the enrollment in these offerings is summed to create the total class size, provided the four-digit course (catalog) number matches. Classes where the course number does not match are considered different enough to be counted separately. Examples: PHYS 1023 01 with an enrollment of 12 students is taught with PHYS 1023H 001 (3 students), for a total enrollment of 15. However, if ISYS 4243 002 (10 students) is taught with ISYS 450V 001 (5 students), these are considered two separate classes.

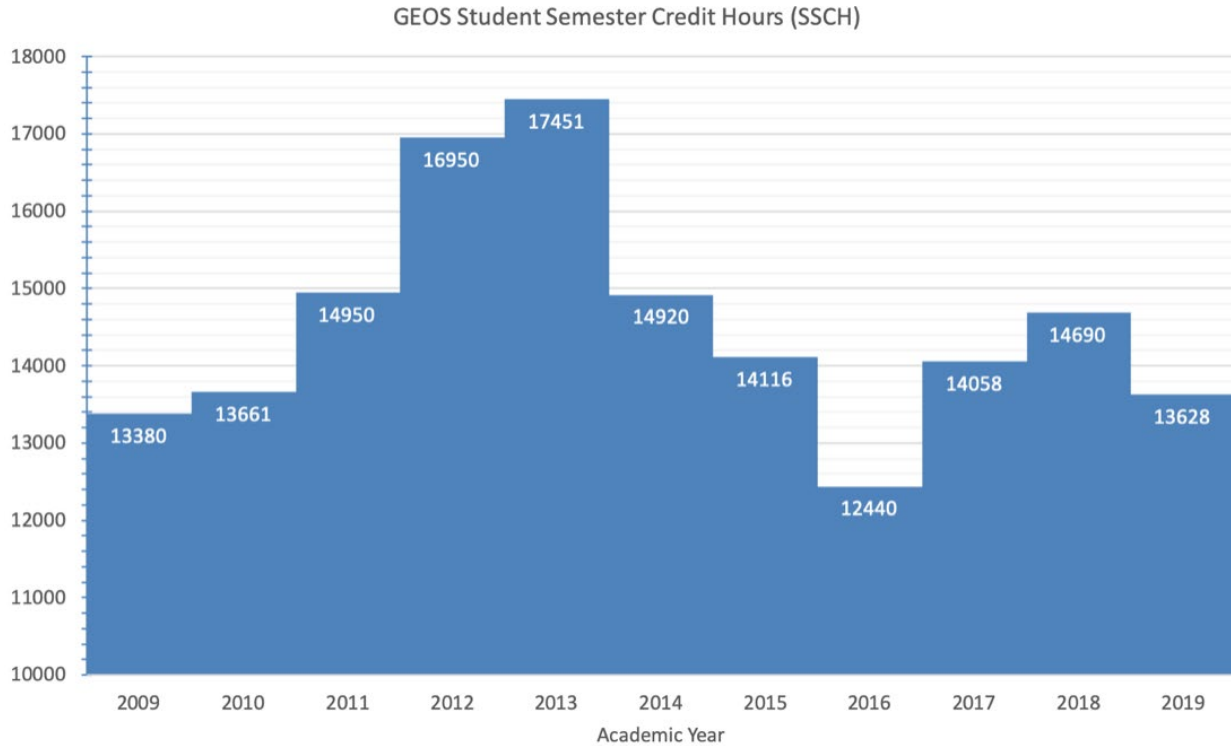
C.5. Class Size Frequencies

Program Review: Class Data - Class Size Frequencies								
Department of Geosciences -- Undergraduate								
Number of Organized Undergraduate Class Sections by Enrollment Range and Academic Year								
Academic Year	Class Enrollment Ranges							Total
	1-9	10-19	20-29	30-39	40-49	50-99	100+	
2013	8	19	95	9	3	3	20	157
2014	12	32	70	9	3	5	16	147
2015	18	40	62	6	3	5	14	148
2016	26	36	46	8	3	9	11	139
2017	19	20	80	2	8	3	15	147
2018	22	17	87	7	4	3	16	156
2019	22	21	78	9	4	4	15	153
<b>Total</b>	<b>127</b>	<b>185</b>	<b>518</b>	<b>50</b>	<b>28</b>	<b>32</b>	<b>107</b>	<b>1,047</b>

Department of Geosciences -- Graduate								
Number of Organized Graduate Class Sections by Enrollment Range and Academic Year								
Academic Year	Class Enrollment Ranges							Total
	1-9	10-19	20-29	30-39	40-49	50-99	100+	
2013	8	4	0	0	0	0	0	12
2014	4	6	5	0	0	0	0	15
2015	10	6	3	0	0	0	0	19
2016	28	9	0	0	0	0	0	37
2017	36	9	2	0	0	0	0	47
2018	43	6	0	0	0	0	0	49
2019	40	4	0	0	0	0	0	44
<b>Total</b>	<b>169</b>	<b>44</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>223</b>

### C.6. Student Semester Credit Hours (SSCH)

Geosciences department student semester credit hours peaked in 2013 but remain competitive with similar departments. Discussion of budget allocations based on SSCH are being discussed which would cause us to examine SSCH trends more carefully.



#### Determining Course Level

When courses were created in the student information system (UAConnect), they were assigned a career of undergraduate, graduate or law. In general, courses are assigned a career based on the type of credit (undergraduate, graduate or law) the student will earn. For example, students who were seeking a baccalaureate should be enrolled in courses at the undergraduate level. Students who were seeking a graduate degree should be enrolled in courses at the graduate level.

Occasionally, graduate students have enrolled in courses with careers of undergraduate; in these cases students received undergraduate credit. The course career is only one component in determining the level of Student Semester Credit Hours (SSCH; one student enrolled in a 3 hour course generates 3 SSCH).

The SSCH production for all courses where the first digit was a 0, 1 or 2 and were classified as undergraduate were assigned a course level of Lower Undergraduate Level. The exceptions to this were remedial classes which were assigned the Remedial Level. Undergraduate courses

with a first digit greater than or equal to 3 generated SSCHs classified as Upper Undergraduate Level.

The methodology of determining course level is different for courses with careers of Law or Graduate. The course level matrix shown in the table below depicts how student level is used to determine course level. Students pursuing a baccalaureate, specialist or doctorate degree and who were enrolled in courses with a Graduate career generated SSCHs at the Upper Undergraduate Level, Specialist Level and Doctorate Level, respectively. Students pursuing a graduate certificate, master's, law degree or were non-degree graduate students and who were enrolled in courses with a graduate career generated SSCHs at the Master's Level.

Students pursuing a baccalaureate, a master's, a graduate certificate or were non-degree seeking graduate students and who were enrolled in courses with the career of Law, generated SSCHs at the Master's Level. Students pursuing a specialist or doctorate and who were enrolled in courses with the career of Law, generated SSCHs at the Specialist Level and Doctorate Level, respectively. Law students enrolled in courses with a career of law generated SSCHs at the Law Level.

### Arkansas Higher Education Information System Course Level Matrix

		Student Level							
Course		Baccalaureate (Degree & Non-Degree)		Graduate, Non-Degree	Graduate Certificate	Master's	Specialist	Doctorate	Law (Degree & Non-Degree)
		Freshmen / Sophomore	Junior / Senior						
MATH0003, ENGL0003, ENGL0013		0	0	0	0	0	0	0	0
		Student Level							
Course Career	First Digit of Catalog Number	Baccalaureate (Degree & Non-Degree)		Graduate, Non-Degree	Graduate Certificate	Master's	Specialist	Doctorate	Law (Degree & Non-Degree)
		Freshmen / Sophomore	Junior / Senior						
Undergraduate	0, 1, 2	1	1	1	1	1	1	1	1
Undergraduate	3, 4, 5, 6, 7	2	2	2	2	2	2	2	2
Graduate	3, 4, 5, 6, 7	2	2	3	3	3	4	5	3
Law	3, 4, 5, 6, 7	N/A	3	3	3	3	4	5	6
Course Level									
		0 = Remedial Level Course				4 = Specialist Level Course			
		1 = Lower Undergraduate Level Course				5 = Doctoral Level Course			
		2 = Upper Undergraduate Level Course				6 = Law Level Course			
		3 = Master's Level Course							

### Definitions associated with Student Semester Credit Hour (SSCH) productivity

**Organized Classes** – A class was defined as organized if it met at regularly scheduled times in a specified instructional facility (e.g. lecture and seminar). Examples of classes that were excluded from this definition include: independent study, thesis or dissertation research, and individual instruction. Only classes identified as organized in the student information system (UACConnect) as of the 11<sup>th</sup> class day for fall and spring terms and the 5<sup>th</sup> class day for summer terms were included in these totals.

**Distance Education** – A class is defined as being taught via distance education if it employed telecommunications as the means of instruction. Only classes identified as telecommunications in the student information system (UACConnect) as of the 11<sup>th</sup> class day for fall and spring terms and the 5<sup>th</sup> class day for summer terms were included in these totals. Examples of telecommunications include:

One Way Real-Time Technology - Instructional activity was one-way in that it was seen or heard as it was being broadcast. It was one-way from instructor to students, and students generally did not use the technology to communicate with the faculty member. Examples: television, cable, and radio.

Two Way Real-Time (immediate) Technology: Students used technology to communicate with the instructor or other students; however, all members were present at one time to interact. Examples: videoconferencing (including freeze frame, compressed, and full-motion video systems), CUSeeMe, interactive satellite (uplink/downlink), conference calls/audio teleconferencing, audiographic conferencing, one-to-one telephone, and real-time e-mail chat.

One Way Asynchronous (delayed) Technology: Students viewed information but generally did not use the technology to communicate with the instructor or other students; thus, it was one-way. Unlike television, cable, or radio, these were not real-time, and large amounts of information could not be stored and used as needed by the student. Some forms of this technology permit multimedia (e.g., web sites may contain sound) or permit interaction (CD-ROMs programmed with JAVA), but they were asynchronous in that the student interacted with the media independent of the faculty member. Examples: HTML web sites, web sites without web boards, video and audio tapes usually delivered via mail, and CD-ROMs.

Two Way Asynchronous (delayed) Technology: Students and the instructor communicated using technology at different times. Examples: one-to-one e-mail and electronic group discussion/computer mediated communication which included listservs (bulletin boards) and web boards.

In the 2011 academic year, technology type began being reported as ‘00’ = not distance education, ‘WB’ = web-based distance education, ‘SS’ = Site-to-site distance education, and ‘OT’ = Other.





### C.7. UA Faculty Salaries Compared to National Averages

Department of Geosciences															
Fall 2016					Fall 2017					Fall 2018					
University of Arkansas					University of Arkansas					University of Arkansas					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor <sup>1</sup>	Instructor <sup>1</sup>	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor <sup>1</sup>	Instructor <sup>1</sup>	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor <sup>1</sup>	Instructor <sup>1</sup>	
Average Salary	\$125,782	\$80,892	\$66,394	\$66,000	\$35,908	\$121,932	\$72,338	\$69,605	\$67,667	\$37,208	\$129,843	\$75,934	\$70,786	\$68,000	\$36,591
High Salary	\$174,886	\$92,866	\$67,700	\$66,000	\$39,415	\$179,795	\$74,035	\$73,000	\$73,000	\$40,715	\$182,352	\$78,500	\$74,500	\$68,000	\$41,415
Low Salary	\$87,588	\$71,478	\$64,000	\$66,000	\$32,500	\$87,588	\$70,642	\$65,000	\$65,000	\$33,800	\$91,332	\$72,142	\$66,500	\$68,000	\$32,640
Number of Faculty	8	3	9	1	3	10	2	11	3	3	8	5	7	1	4
Research Universities / Very High Research Activity					Research Universities / Very High Research Activity					Research Universities / Very High Research Activity					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	
Average Salary	\$126,480	\$89,579	\$76,971	\$72,911	\$59,941	\$136,688	\$92,631	\$79,193	\$76,496	\$62,870	\$138,849	\$94,585	\$79,817	\$80,779	\$62,711
High Salary	\$262,001	\$165,300	\$129,945	\$90,000	\$163,800	\$293,500	\$168,606	\$115,895	\$92,000	\$147,276	\$309,300	\$173,664	\$120,240	\$105,000	\$147,276
Low Salary	\$67,019	\$38,447	\$47,000	\$47,000	\$20,000	\$69,695	\$37,201	\$45,855	\$46,350	\$27,819	\$49,091	\$37,606	\$46,350	\$47,127	\$24,877
Number of Faculty	459	240	279	27	86	546	259	261	29	84	602	287	310	36	87
Number of Institutions	46	45	43	18	23	53	49	51	18	27	60	59	57	28	29
Research Universities / High Research Activity					Research Universities / High Research Activity					Research Universities / High Research Activity					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	
Average Salary	\$113,636	\$86,056	\$70,122	\$71,789	\$46,500	\$116,208	\$86,458	\$70,892	\$73,172	\$46,155	\$118,433	\$90,815	\$73,934	\$75,643	\$49,571
High Salary	\$211,494	\$133,900	\$100,716	\$94,450	\$66,402	\$198,398	\$138,587	\$100,716	\$87,720	\$59,402	\$200,888	\$135,862	\$93,592	\$85,000	\$70,634
Low Salary	\$77,894	\$65,914	\$41,397	\$58,909	\$34,808	\$75,292	\$56,753	\$42,230	\$62,500	\$35,504	\$86,331	\$63,352	\$45,710	\$67,000	\$32,000
Number of Faculty	136	92	90	17	12	134	88	93	11	14	91	52	53	8	9
Number of Institutions	27	27	26	12	8	26	26	24	8	8	18	17	17	6	6
RU/VH and RU/H Combined					RU/VH and RU/H Combined					RU/VH and RU/H Combined					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	
Average Salary	\$123,544	\$88,603	\$75,301	\$72,478	\$58,295	\$132,652	\$91,066	\$77,012	\$75,582	\$60,482	\$136,168	\$94,007	\$78,958	\$79,845	\$61,479
High Salary	\$262,001	\$165,300	\$129,945	\$94,450	\$163,800	\$293,500	\$168,606	\$115,895	\$92,000	\$147,276	\$309,300	\$173,664	\$120,240	\$105,000	\$147,276
Low Salary	\$67,019	\$38,447	\$41,397	\$47,000	\$20,000	\$69,695	\$37,201	\$42,230	\$46,350	\$27,819	\$49,091	\$37,606	\$45,710	\$47,127	\$24,877
UofA salary as % of Research Univs Combined	101.8%	91.3%	88.2%	91.1%	61.6%	91.9%	79.4%	90.4%	89.5%	61.5%	95.4%	80.8%	89.7%	85.2%	59.5%
High Salary	66.8%	58.2%	52.1%	69.9%	24.1%	61.3%	43.9%	63.0%	79.3%	27.6%	59.0%	45.2%	62.0%	64.8%	28.1%
Low Salary	130.7%	185.9%	154.6%	140.4%	162.5%	125.7%	189.9%	153.9%	140.2%	121.5%	186.0%	191.8%	145.5%	144.3%	131.2%

2019 - 20 Program Review: Average Salary of Instructional Faculty <sup>1</sup> at the University of Arkansas and Nationally <sup>2</sup>															
Department of Geosciences															
Fall 2013					Fall 2014					Fall 2015					
University of Arkansas					University of Arkansas					University of Arkansas					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor <sup>1</sup>	Instructor <sup>1</sup>	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor <sup>1</sup>	Instructor <sup>1</sup>	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor <sup>1</sup>	Instructor <sup>1</sup>	
Average Salary	\$112,611	\$73,099	\$62,163	\$62,000	\$35,278	\$118,826	\$76,577	\$64,330	\$64,000	\$35,142	\$121,253	\$77,743	\$65,255	N/A	\$35,408
High Salary	\$164,000	\$80,798	\$64,142	\$62,000	\$38,015	\$165,500	\$87,957	\$66,642	\$64,000	\$38,615	\$167,000	\$89,798	\$66,642	N/A	\$38,915
Low Salary	\$82,088	\$65,158	\$61,000	\$62,000	\$33,760	\$84,588	\$68,410	\$63,000	\$64,000	\$32,000	\$86,088	\$69,433	\$64,000	N/A	\$32,000
Number of Faculty	9	4	7	3	3	8	4	8	1	3	8	4	8	0	3
Research Universities / Very High Research Activity					Research Universities / Very High Research Activity					Research Universities / Very High Research Activity					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	
Average Salary	\$120,787	\$85,955	\$73,851	\$72,464	\$48,700	\$122,784	\$87,898	\$76,024	\$74,130	\$56,764	\$124,549	\$88,496	\$76,195	\$75,352	\$54,382
High Salary	\$278,410	\$124,210	\$110,000	\$90,000	\$99,523	\$259,596	\$126,700	\$116,202	\$90,000	\$147,556	\$248,000	\$163,000	\$113,000	\$110,000	\$147,276
Low Salary	\$61,969	\$51,953	\$54,245	\$55,000	\$33,760	\$66,764	\$53,453	\$45,000	\$55,000	\$20,000	\$66,028	\$42,484	\$45,000	\$46,000	\$16,364
Number of Faculty	450	218	167	26	41	452	211	182	32	78	457	241	208	45	77
Number of Institutions	42	45	45	17	21	42	44	44	23	23	44	44	44	24	23
Research Universities / High Research Activity					Research Universities / High Research Activity					Research Universities / High Research Activity					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	
Average Salary	\$106,562	\$77,305	\$66,965	\$65,421	\$47,231	\$109,785	\$79,979	\$68,396	\$71,806	\$48,695	\$113,117	\$82,154	\$69,811	\$71,224	\$47,612
High Salary	\$179,366	\$109,135	\$90,799	\$81,400	\$84,000	\$182,953	\$111,927	\$95,969	\$86,000	\$71,520	\$192,644	\$130,000	\$88,716	\$85,000	\$74,292
Low Salary	\$52,000	\$51,091	\$40,000	\$55,000	\$25,384	\$61,043	\$53,461	\$38,750	\$58,507	\$26,520	\$55,636	\$54,538	\$40,000	\$62,244	\$32,413
Number of Faculty	150	100	77	17	20	154	110	90	14	22	126	84	73	10	15
Number of Institutions	31	30	26	11	13	30	30	30	12	14	25	25	25	8	10
RU/VH and RU/H Combined					RU/VH and RU/H Combined					RU/VH and RU/H Combined					
Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	Professor	Assoc. Professor	Asst. Professor	New Asst. Professor	Instructor	
Average Salary	\$117,231	\$83,235	\$71,678	\$69,680	\$48,218	\$119,481	\$85,184	\$73,500	\$73,423	\$54,989	\$122,078	\$86,857	\$74,537	\$74,601	\$53,278
High Salary	\$278,410	\$124,210	\$110,000	\$90,000	\$99,523	\$259,596	\$126,700	\$116,202	\$90,000	\$147,556	\$248,000	\$163,000	\$113,000	\$110,000	\$147,276
Low Salary	\$52,000	\$51,091	\$40,000	\$55,000	\$25,384	\$61,043	\$53,453	\$38,750	\$55,000	\$20,000	\$55,636	\$42,484	\$40,000	\$46,000	\$16,364
UofA salary as % of Research Univs Combined	96.1%	87.8%	86.7%	89.0%	73.2%	99.5%	89.9%	87.5%	87.2%	63.9%	99.3%	89.5%	87.5%	N/A	66.5%
High Salary	58.9%	65.0%	58.3%	68.9%	38.2%	63.8%	69.4%	57.4%	71.1%	26.2%	67.3%	55.1%	59.0%	N/A	26.4%
Low Salary	157.9%	127.5%	152.5%	112.7%	133.0%	138.6%	128.0%	162.6%	116.4%	160.0%	154.7%	163.4%	160.0%	N/A	195.6%

C.8. Teaching Load 2019

Department of Geosciences							
Spring 2019							
Course Alpha Code	Course Number	Course Name	Instruction Type	Instructor Name	Enrollment (Headcount)	Enrollment (SSCH)	
ENDY	700V	DOCTORAL DISSERTATION	Individualized	DAVIDSON, FIONA M.	1	3	
				TOTAL FOR THIS INSTRUCTOR .....	1	3	
ENDY	5113	GLOBAL CHANGE	Organized	FENG, SONG	7	21	
ENDY	689V	SPECIAL PROB IN ENV DYNAM	Individualized	FENG, SONG	1	3	
ENDY	700V	DOCTORAL DISSERTATION	Individualized	FENG, SONG	1	1	
				TOTAL FOR THIS INSTRUCTOR .....	9	25	
ENDY	5853	ENVIRONMENTAL ISOTOPE GEO	Organized	HAYS, PHILLIP D	1	3	
				TOTAL FOR THIS INSTRUCTOR .....	1	3	
ENDY	689V	SPECIAL PROB IN ENV DYNAM	Individualized	PARADISE, THOMAS R.	1	3	
ENDY	700V	DOCTORAL DISSERTATION	Individualized	PARADISE, THOMAS R.	1	6	
				TOTAL FOR THIS INSTRUCTOR .....	2	9	
ENDY	700V	DOCTORAL DISSERTATION	Individualized	STAHLE, DAVID W.	1	5	
				TOTAL FOR THIS INSTRUCTOR .....	1	5	
				TOTAL FOR THIS ALPHA CODE .....	14	45	
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	AHMED, MOAMEN MOHAMED ALMAZ	44	44	
				TOTAL FOR THIS INSTRUCTOR .....	44	44	
GEOS	4233	GEOGRAPHY OF RELIGION	Organized	ALLEN, SPENCER	17	51	
				TOTAL FOR THIS INSTRUCTOR .....	17	51	
GEOS	4653	GIS ANALYSIS & MODELING	Organized	ALY, MOHAMED H.	1	3	
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	ALY, MOHAMED H.	1	2	
GEOS	5653	GIS ANALYSIS & MODELING	Organized	ALY, MOHAMED H.	6	18	
GEOS	600V	MASTER'S THESIS	Individualized	ALY, MOHAMED H.	2	4	
GEOS	700V	DOCTORAL DISSERTATION	Individualized	ALY, MOHAMED H.	1	9	
				TOTAL FOR THIS INSTRUCTOR .....	11	36	
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	AMARAL, CHELSEA M.	68	68	
				TOTAL FOR THIS INSTRUCTOR .....	68	68	
GEOS	1113	GENERAL GEOLOGY	Organized	ANDERSON, PAULA E.	410	1,230	
				TOTAL FOR THIS INSTRUCTOR .....	410	1,230	
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	BALL, CHARLES A.	68	68	
				TOTAL FOR THIS INSTRUCTOR .....	68	68	
GEOS	1113	GENERAL GEOLOGY	Organized	BOSS, STEVE K.	215	645	
				TOTAL FOR THIS INSTRUCTOR .....	215	645	
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	BOUDREAUX, ASHER R.	65	65	
				TOTAL FOR THIS INSTRUCTOR .....	65	65	
GEOS	4363	CLIMATOLOGY	Organized	CHENG, LINYIN	8	24	
GEOS	5363	CLIMATOLOGY	Organized	CHENG, LINYIN	3	9	
				TOTAL FOR THIS INSTRUCTOR .....	11	33	
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	CORBIN, TANNER W.	23	23	
				TOTAL FOR THIS INSTRUCTOR .....	23	23	
GEOS	3013	FOUNDATIONS GEOSPATIAL DA	Organized	COTHREN, JACKSON D.	11	33	
GEOS	3563	GEOSPATIAL DATA MINING	Organized	COTHREN, JACKSON D.	6	18	
GEOS	5043	FOUNDATIONS GEOSPATIAL DA	Organized	COTHREN, JACKSON D.	2	6	
GEOS	5083	GEOSPATIAL DATA MINING	Organized	COTHREN, JACKSON D.	4	12	
GEOS	600V	MASTER'S THESIS	Individualized	COTHREN, JACKSON D.	1	1	
GEOS	700V	DOCTORAL DISSERTATION	Individualized	COTHREN, JACKSON D.	1	6	
				TOTAL FOR THIS INSTRUCTOR .....	25	76	

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GEOS	3901	JUNIOR HONORS COURSE I	Organized	COVINGTON, MATTHEW D.	1	1
GEOS	4153	KARST HYDROGEOLOGY	Organized	COVINGTON, MATTHEW D.	7	21
GEOS	4873	GEOLOGICAL DATA ANALYSIS	Organized	COVINGTON, MATTHEW D.	11	33
GEOS	4982H	SENIOR HONORS II	Individualized	COVINGTON, MATTHEW D.	1	2
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	COVINGTON, MATTHEW D.	2	4
GEOS	5753	KARST HYDROGEOLOGY	Organized	COVINGTON, MATTHEW D.	1	3
GEOS	5873	GEOLOGICAL DATA ANALYSIS	Organized	COVINGTON, MATTHEW D.	6	18
GEOS	600V	MASTER'S THESIS	Individualized	COVINGTON, MATTHEW D.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	30	85
GEOS	1123	HUMAN GEOGRAPHY	Organized	DAVIDSON, FIONA M.	39	117
GEOS	2003	WORLD REGIONAL GEOGRAPHY	Organized	DAVIDSON, FIONA M.	39	117
GEOS	4073	URBAN GEOGRAPHY	Organized	DAVIDSON, FIONA M.	16	48
GEOS	410VH	HON SPEC PROBLEMS IN GEOS	Individualized	DAVIDSON, FIONA M.	3	8
GEOS	5173	URBAN GEOGRAPHY	Organized	DAVIDSON, FIONA M.	1	3
GEOS	600V	MASTER'S THESIS	Individualized	DAVIDSON, FIONA M.	2	9
				TOTAL FOR THIS INSTRUCTOR .....	100	302
GEOS	4033	HYDROGEOLOGY	Organized	DAVIS, RALPH K.	16	48
GEOS	5263	HYDROGEOLOGY	Organized	DAVIS, RALPH K.	2	6
				TOTAL FOR THIS INSTRUCTOR .....	18	54
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	DUBOIS, KALLI A.	22	22
				TOTAL FOR THIS INSTRUCTOR .....	22	22
GEOS	3514	STRUCTURAL GEOLOGY	Organized	DUMOND, GREGORY	38	152
				TOTAL FOR THIS INSTRUCTOR .....	38	152
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	FALZONE, CHRISTAIN J.	70	70
				TOTAL FOR THIS INSTRUCTOR .....	70	70
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	FENG, SONG	1	3
GEOS	5113	GLOBAL CHANGE	Organized	FENG, SONG	2	6
GEOS	600V	MASTER'S THESIS	Individualized	FENG, SONG	1	3
				TOTAL FOR THIS INSTRUCTOR .....	4	12
GEOS	2003	WORLD REGIONAL GEOGRAPHY	Organized	FITZGERALD, KAITLYN V.	93	279
				TOTAL FOR THIS INSTRUCTOR .....	93	279
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	FLETCHER, EMILY M.	66	66
				TOTAL FOR THIS INSTRUCTOR .....	66	66
GEOS	5853	ENVIRONMENTAL ISOTOPE GEO	Organized	HAYS, PHILLIP D	4	12
GEOS	700V	DOCTORAL DISSERTATION	Individualized	HAYS, PHILLIP D	1	6
				TOTAL FOR THIS INSTRUCTOR .....	5	18
GEOS	1123	HUMAN GEOGRAPHY	Organized	HINTZ, RASHAUNA N.	213	639
				TOTAL FOR THIS INSTRUCTOR .....	213	639
GEOS	4493	GEOG OF POLITICAL VIOLENC	Organized	HOLLAND, EDWARD C.	2	6
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	HOLLAND, EDWARD C.	2	6
GEOS	5612	RESEARCH METHODS IN GEOS	Organized	HOLLAND, EDWARD C.	18	36
GEOS	600V	MASTER'S THESIS	Individualized	HOLLAND, EDWARD C.	1	6
				TOTAL FOR THIS INSTRUCTOR .....	23	54
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	JIMERSON, COLE R.	69	69
				TOTAL FOR THIS INSTRUCTOR .....	69	69
GEOS	5863	QUANTITATIVE TECH IN GEOS	Organized	KVAMME, KENNETH L.	6	18
				TOTAL FOR THIS INSTRUCTOR .....	6	18
GEOS	3543	GEOSPATIAL APPLICATIONS	Organized	LIMP, WILLIAM F. JR.	53	159
GEOS	3553	SPATIAL ANALYSIS USING AR	Organized	LIMP, WILLIAM F. JR.	11	33
GEOS	3593	INTRODUCTION TO GEODATABA	Organized	LIMP, WILLIAM F. JR.	3	9
GEOS	5543	GEOSPATIAL APPLICATIONS	Organized	LIMP, WILLIAM F. JR.	3	9
GEOS	5553	SPATIAL ANALYSIS USING AR	Organized	LIMP, WILLIAM F. JR.	7	21
GEOS	5593	INTRO TO GEODATABASES	Organized	LIMP, WILLIAM F. JR.	2	6
				TOTAL FOR THIS INSTRUCTOR .....	79	237

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GEOS	1131L	EARTH SCIENCE LAB	Organized	LINCK, RACHEL F.	47	47
				TOTAL FOR THIS INSTRUCTOR .....	47	47
GEOS	600V	MASTER'S THESIS	Individualized	LINER, CHRISTOPHER L.	1	6
GEOS	700V	DOCTORAL DISSERTATION	Individualized	LINER, CHRISTOPHER L.	1	6
				TOTAL FOR THIS INSTRUCTOR .....	2	12
GEOS	3062	GEOLOGY OF ARKANSAS	Organized	MANGER, WALTER L.	18	36
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	MANGER, WALTER L.	2	5
GEOS	600V	MASTER'S THESIS	Individualized	MANGER, WALTER L.	3	7
				TOTAL FOR THIS INSTRUCTOR .....	23	48
GEOS	4053	GEOMORPHOLOGY	Organized	MARSHALL, JILL A.	15	45
GEOS	437V	GEOLOGY FIELD TRIP	Organized	MARSHALL, JILL A.	6	8
GEOS	5253	GEOMORPHOLOGY	Organized	MARSHALL, JILL A.	4	12
GEOS	537V	GEOLOGY FIELD TRIP	Organized	MARSHALL, JILL A.	1	2
				TOTAL FOR THIS INSTRUCTOR .....	26	67
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	MCGILVERY, THOMAS A.	8	24
GEOS	5223	SEDIMENTARY PETROLOGY	Organized	MCGILVERY, THOMAS A.	4	12
GEOS	600V	MASTER'S THESIS	Individualized	MCGILVERY, THOMAS A.	2	9
				TOTAL FOR THIS INSTRUCTOR .....	14	45
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	MMASA, DENNIS A.	68	68
				TOTAL FOR THIS INSTRUCTOR .....	68	68
GEOS	1111M	HNRS GENERAL GEOLOGY LAB	Organized	MORRIS, NOAH S.	9	9
				TOTAL FOR THIS INSTRUCTOR .....	9	9
GEOS	1131L	EARTH SCIENCE LAB	Organized	NAGY, KRISTINE M.	47	47
				TOTAL FOR THIS INSTRUCTOR .....	47	47
GEOS	1131L	EARTH SCIENCE LAB	Organized	OEFINGER, JORDAN A.	46	46
				TOTAL FOR THIS INSTRUCTOR .....	46	46
GEOS	4393	AMERICAN PUBLIC LANDS	Organized	PARADISE, THOMAS R.	19	57
GEOS	4393H	HON AMERICAN PUBLIC LANDS	Organized	PARADISE, THOMAS R.	1	3
GEOS	4523	CARTOGRAPHIC DESIGN & PRO	Organized	PARADISE, THOMAS R.	11	33
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	PARADISE, THOMAS R.	1	3
GEOS	5403	AMERICAN PUBLIC LANDS	Organized	PARADISE, THOMAS R.	4	12
GEOS	5523	CARTOGRAPHIC DESIGN & PRO	Organized	PARADISE, THOMAS R.	6	18
GEOS	600V	MASTER'S THESIS	Individualized	PARADISE, THOMAS R.	2	12
GEOS	700V	DOCTORAL DISSERTATION	Individualized	PARADISE, THOMAS R.	2	15
				TOTAL FOR THIS INSTRUCTOR .....	46	153
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	PATTERSON, RUBY V.	70	70
				TOTAL FOR THIS INSTRUCTOR .....	70	70
GEOS	437V	GEOLOGY FIELD TRIP	Organized	POTRA, ADRIANA	6	11
GEOS	537V	GEOLOGY FIELD TRIP	Organized	POTRA, ADRIANA	2	3
GEOS	600V	MASTER'S THESIS	Individualized	POTRA, ADRIANA	1	3
				TOTAL FOR THIS INSTRUCTOR .....	9	17
GEOS	3413	SEDIMENTARY ROCKS & FOSSI	Organized	SHARMAN, GLENN R.	24	72
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	SHARMAN, GLENN R.	2	6
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	SHARMAN, GLENN R.	3	9
GEOS	600V	MASTER'S THESIS	Individualized	SHARMAN, GLENN R.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	30	90
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	SHAW, JOHN B.	1	2
GEOS	600V	MASTER'S THESIS	Individualized	SHAW, JOHN B.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	2	5
GEOS	4933	ANCIENT FOREST	Organized	STAHLE, DAVID W.	12	36
GEOS	4982H	SENIOR HONORS II	Individualized	STAHLE, DAVID W.	1	2
GEOS	5011	COLLOQUIUM	Organized	STAHLE, DAVID W.	8	8
GEOS	5933	ANCIENT FOREST	Organized	STAHLE, DAVID W.	1	3
GEOS	600V	MASTER'S THESIS	Individualized	STAHLE, DAVID W.	1	6
GEOS	700V	DOCTORAL DISSERTATION	Individualized	STAHLE, DAVID W.	2	4
				TOTAL FOR THIS INSTRUCTOR .....	25	59

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GEOS	3901	JUNIOR HONORS COURSE I	Organized	SUAREZ, CELINA A.	1	1
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	SUAREZ, CELINA A.	2	4
GEOS	4924	EARTH SYSTEM HISTORY	Organized	SUAREZ, CELINA A.	22	88
GEOS	700V	DOCTORAL DISSERTATION	Individualized	SUAREZ, CELINA A.	1	6
				TOTAL FOR THIS INSTRUCTOR .....	26	99
GEOS	1133	EARTH SCIENCE	Organized	TORBENSON, MAX CARL ARNE	157	471
				TOTAL FOR THIS INSTRUCTOR .....	157	471
GEOS	3103	GEOSPATIAL COMPUTING TOOL	Organized	TULLIS, JASON A.	9	27
GEOS	5073	GEOSPATIAL COMPUTING TOOL	Organized	TULLIS, JASON A.	3	9
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	TULLIS, JASON A.	2	6
GEOS	600V	MASTER'S THESIS	Individualized	TULLIS, JASON A.	1	6
				TOTAL FOR THIS INSTRUCTOR .....	15	48
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	TURNER, HENRY L. III	44	44
GEOS	1111M	HNRS GENERAL GEOLOGY LAB	Organized	TURNER, HENRY L. III	9	9
GEOS	1113	GENERAL GEOLOGY	Organized	TURNER, HENRY L. III	145	435
GEOS	1113H	HNRS GENERAL GEOLOGY	Organized	TURNER, HENRY L. III	19	57
				TOTAL FOR THIS INSTRUCTOR .....	217	545
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	WHITE, TRAVIS G.	68	68
				TOTAL FOR THIS INSTRUCTOR .....	68	68
GEOS	5223	SEDIMENTARY PETROLOGY	Organized	ZACHRY, DOY L. JR.	4	12
				TOTAL FOR THIS INSTRUCTOR .....	4	12
				TOTAL FOR THIS ALPHA CODE .....	2,744	6,442
INST	4103	GEOG OF POLITICAL VIOLENC	Organized	HOLLAND, EDWARD C.	5	15
				TOTAL FOR THIS INSTRUCTOR .....	5	15
				TOTAL FOR THIS ALPHA CODE .....	5	15
				TOTAL FOR THIS DEPARTMENT .....	2,763	6,502



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<b>Department of Geosciences</b>						
<b>Summer I 2019</b>						
<b>Course Alpha Code</b>	<b>Course Number</b>	<b>Course Name</b>	<b>Instruction Type</b>	<b>Instructor Name</b>	<b>Enrollment (Headcount)</b>	<b>Enrollment (SSCH)</b>
ENDY	689V	SPECIAL PROB IN ENV DYNAM	Individualized	HAYS, PHILLIP D	1	3
				TOTAL FOR THIS INSTRUCTOR .....	1	3
ENDY	700V	DOCTORAL DISSERTATION	Individualized	PARADISE, THOMAS R.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	1	3
				TOTAL FOR THIS ALPHA CODE .....	2	6
GEOS	1113	GENERAL GEOLOGY	Organized	ANDERSON, PAULA E.	21	63
				TOTAL FOR THIS INSTRUCTOR .....	21	63
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	CORBIN, TANNER W.	22	22
				TOTAL FOR THIS INSTRUCTOR .....	22	22
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	COTHREN, JACKSON D.	1	3
GEOS	700V	DOCTORAL DISSERTATION	Individualized	COTHREN, JACKSON D.	1	1
				TOTAL FOR THIS INSTRUCTOR .....	2	4
GEOS	700V	DOCTORAL DISSERTATION	Individualized	COVINGTON, MATTHEW D.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	1	3
GEOS	600V	MASTER'S THESIS	Individualized	DAVIDSON, FIONA M.	2	4
				TOTAL FOR THIS INSTRUCTOR .....	2	4
GEOS	600V	MASTER'S THESIS	Individualized	DUMOND, GREGORY	1	3
				TOTAL FOR THIS INSTRUCTOR .....	1	3
GEOS	4686	GEOLOGY FIELD CAMP	Organized	HAYS, PHILLIP D	5	30
GEOS	700V	DOCTORAL DISSERTATION	Individualized	HAYS, PHILLIP D	1	3
				TOTAL FOR THIS INSTRUCTOR .....	6	33
GEOS	4686	GEOLOGY FIELD CAMP	Organized	LAMB, ANDREW P.	4	24
				TOTAL FOR THIS INSTRUCTOR .....	4	24
GEOS	600V	MASTER'S THESIS	Individualized	LINER, CHRISTOPHER L.	1	3
GEOS	700V	DOCTORAL DISSERTATION	Individualized	LINER, CHRISTOPHER L.	1	1
				TOTAL FOR THIS INSTRUCTOR .....	2	4
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	PARADISE, THOMAS R.	1	3
GEOS	600V	MASTER'S THESIS	Individualized	PARADISE, THOMAS R.	1	6
GEOS	700V	DOCTORAL DISSERTATION	Individualized	PARADISE, THOMAS R.	2	7
				TOTAL FOR THIS INSTRUCTOR .....	4	16
GEOS	4686	GEOLOGY FIELD CAMP	Organized	POTRA, ADRIANA	4	24
				TOTAL FOR THIS INSTRUCTOR .....	4	24
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	SHARMAN, GLENN R.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	1	3
GEOS	4686	GEOLOGY FIELD CAMP	Organized	SUAREZ, CELINA A.	4	24
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	SUAREZ, CELINA A.	1	3
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	SUAREZ, CELINA A.	1	3
GEOS	700V	DOCTORAL DISSERTATION	Individualized	SUAREZ, CELINA A.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	7	33
				TOTAL FOR THIS ALPHA CODE .....	77	236
				TOTAL FOR THIS DEPARTMENT .....	79	242

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Department of Geosciences							
Fall 2018							
Course Alpha Code	Course Number	Section	Course Name	Instruction Type	Instructor Name	Enrollment (Headcount)	Enrollment (SSCH)
ENDY	6013		ENVIRONMENTAL DYNAMICS	Organized	BOSS, STEVE K.	3	9
					TOTAL FOR THIS INSTRUCTOR .....	3	9
ENDY	700V		DOCTORAL DISSERTATION	Individualized	DAVIDSON, FIONA M.	1	3
					TOTAL FOR THIS INSTRUCTOR .....	1	3
ENDY	5053		QUATERNARY ENVIRONMENTS	Organized	FENG, SONG	3	9
ENDY	689V		SPECIAL PROB IN ENV DYNAM	Individualized	FENG, SONG	1	5
ENDY	700V		DOCTORAL DISSERTATION	Individualized	FENG, SONG	1	1
					TOTAL FOR THIS INSTRUCTOR .....	5	15
ENDY	700V		DOCTORAL DISSERTATION	Individualized	PARADISE, THOMAS R.	1	3
					TOTAL FOR THIS INSTRUCTOR .....	1	3
ENDY	700V		DOCTORAL DISSERTATION	Individualized	STAHL, DAVID W.	1	6
					TOTAL FOR THIS INSTRUCTOR .....	1	6
					TOTAL FOR THIS ALPHA CODE .....	11	36
GEOS	1111L		GENERAL GEOLOGY LAB	Organized	AHMED, MOAMEN MOHAMED ALMAZ	43	43
					TOTAL FOR THIS INSTRUCTOR .....	43	43
GEOS	1113		GENERAL GEOLOGY	Organized	ALY, MOHAMED H.	214	642
GEOS	560V		GRADUATE SPECIAL PROBLEMS	Individualized	ALY, MOHAMED H.	1	3
GEOS	600V		MASTER'S THESIS	Individualized	ALY, MOHAMED H.	2	9
GEOS	700V		DOCTORAL DISSERTATION	Individualized	ALY, MOHAMED H.	1	9
					TOTAL FOR THIS INSTRUCTOR .....	218	663
GEOS	1111L		GENERAL GEOLOGY LAB	Organized	AMARAL, CHELSEA M.	61	61
					TOTAL FOR THIS INSTRUCTOR .....	61	61
GEOS	1113		GENERAL GEOLOGY	Organized	ANDERSON, PAULA E.	259	777
GEOS	3043		SUSTAINING EARTH	Organized	ANDERSON, PAULA E.	37	111
GEOS	3043H		HONORS SUSTAINING EARTH	Organized	ANDERSON, PAULA E.	1	3
					TOTAL FOR THIS INSTRUCTOR .....	297	891
GEOS	1111M		HNRS GENERAL GEOLOGY LAB	Organized	BLACKSTOCK, JOSHUA M.	10	10
					TOTAL FOR THIS INSTRUCTOR .....	10	10
GEOS	3333		OCEANOGRAPHY	Organized	BOSS, STEVE K.	36	108
					TOTAL FOR THIS INSTRUCTOR .....	36	108
GEOS	1111L		GENERAL GEOLOGY LAB	Organized	BOUDREAUX, ASHER R.	29	29
					TOTAL FOR THIS INSTRUCTOR .....	29	29
GEOS	4223		STRATIGRAPHY/SEDIMENTANT	Organized	CAINS, JULIE M.	7	21
					TOTAL FOR THIS INSTRUCTOR .....	7	21
GEOS	1111L		GENERAL GEOLOGY LAB	Organized	CORBIN, TANNER W.	66	66
					TOTAL FOR THIS INSTRUCTOR .....	66	66
GEOS	3013		FOUNDATIONS GEOSPATIAL DA	Organized	COTHREN, JACKSON D.	6	18
GEOS	3563		GEOSPATIAL DATA MINING	Organized	COTHREN, JACKSON D.	1	3
GEOS	4793		GEOSPATIAL UAS	Organized	COTHREN, JACKSON D.	1	3
GEOS	5043		FOUNDATIONS GEOSPATIAL DA	Organized	COTHREN, JACKSON D.	5	15
GEOS	5083		GEOSPATIAL DATA MINING	Organized	COTHREN, JACKSON D.	3	9
GEOS	5793		GEOSPATIAL UAS	Organized	COTHREN, JACKSON D.	2	6
GEOS	600V		MASTER'S THESIS	Individualized	COTHREN, JACKSON D.	1	3
GEOS	700V		DOCTORAL DISSERTATION	Individualized	COTHREN, JACKSON D.	1	6
					TOTAL FOR THIS INSTRUCTOR .....	20	63
GEOS	4972H		SENIOR HONORS I	Individualized	COVINGTON, MATTHEW D.	1	2
GEOS	700V		DOCTORAL DISSERTATION	Individualized	COVINGTON, MATTHEW D.	2	7
					TOTAL FOR THIS INSTRUCTOR .....	3	9

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GEOS	1123	HUMAN GEOGRAPHY	Organized	DAVIDSON, FIONA M.	31	93
GEOS	2003H	HON WORLD REGIONAL GEOG	Organized	DAVIDSON, FIONA M.	20	60
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	DAVIDSON, FIONA M.	5	15
GEOS	410VH	HON SPEC PROBLEMS IN GEOS	Individualized	DAVIDSON, FIONA M.	5	15
GEOS	4783	GEOGRAPHY OF EUROPE	Organized	DAVIDSON, FIONA M.	15	45
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	DAVIDSON, FIONA M.	1	3
GEOS	520V	SPEC PROB HUMAN GEOGRAPHY	Individualized	DAVIDSON, FIONA M.	1	3
GEOS	5783	GEOGRAPHY OF EUROPE	Organized	DAVIDSON, FIONA M.	1	3
GEOS	600V	MASTER'S THESIS	Individualized	DAVIDSON, FIONA M.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	80	240
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	DUBOIS, KALLI A.	53	53
				TOTAL FOR THIS INSTRUCTOR .....	53	53
GEOS	5563	TECTONICS	Organized	DUMOND, GREGORY	7	21
				TOTAL FOR THIS INSTRUCTOR .....	7	21
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	FALZONE, CHRISTAIN J.	39	39
				TOTAL FOR THIS INSTRUCTOR .....	39	39
GEOS	4353	METEOROLOGY	Organized	FENG, SONG	20	60
GEOS	5053	QUATERNARY ENVIRONMENTS	Organized	FENG, SONG	1	3
GEOS	5353	METEOROLOGY	Organized	FENG, SONG	1	3
GEOS	5473	APPLIED CLIMATOLOGY	Organized	FENG, SONG	8	24
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	FENG, SONG	1	3
GEOS	600V	MASTER'S THESIS	Individualized	FENG, SONG	1	3
				TOTAL FOR THIS INSTRUCTOR .....	32	96
GEOS	2003	WORLD REGIONAL GEOGRAPHY	Organized	FITZGERALD, KAITLYN V.	111	333
				TOTAL FOR THIS INSTRUCTOR .....	111	333
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	FLETCHER, EMILY M.	66	66
				TOTAL FOR THIS INSTRUCTOR .....	66	66
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	FOUST, MICHAEL R.	65	65
				TOTAL FOR THIS INSTRUCTOR .....	65	65
GEOS	3103	GEOSPATIAL COMPUTING TOOL	Organized	GIANNAKIS, PANAGIOTIS	4	12
GEOS	3553	SPATIAL ANALYSIS USING AR	Organized	GIANNAKIS, PANAGIOTIS	2	6
GEOS	5073	GEOSPATIAL COMPUTING TOOL	Organized	GIANNAKIS, PANAGIOTIS	2	6
				TOTAL FOR THIS INSTRUCTOR .....	8	24
GEOS	700V	DOCTORAL DISSERTATION	Individualized	HAYS, PHILLIP D	1	6
				TOTAL FOR THIS INSTRUCTOR .....	1	6
GEOS	1123	HUMAN GEOGRAPHY	Organized	HINTZ, RASHAUNA N.	302	906
				TOTAL FOR THIS INSTRUCTOR .....	302	906
GEOS	2003	WORLD REGIONAL GEOGRAPHY	Organized	HOLLAND, EDWARD C.	39	117
				TOTAL FOR THIS INSTRUCTOR .....	39	117
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	JIMERSON, COLE R.	44	44
				TOTAL FOR THIS INSTRUCTOR .....	44	44
GEOS	5053	QUATERNARY ENVIRONMENTS	Organized	KAY, MARVIN	1	3
				TOTAL FOR THIS INSTRUCTOR .....	1	3
GEOS	4553	INTRO TO RASTER GIS	Organized	KVAMME, KENNETH L.	4	12
GEOS	5453	INTRO TO RASTER GIS	Organized	KVAMME, KENNETH L.	7	21
				TOTAL FOR THIS INSTRUCTOR .....	11	33
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	LAMB, ANDREW P	1	1
				TOTAL FOR THIS INSTRUCTOR .....	1	1



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GEOS	3543	GEOSPATIAL APPLICATIONS	Organized	LIMP, WILLIAM F. JR.	66	198
GEOS	3593	INTRODUCTION TO GEODATABA	Organized	LIMP, WILLIAM F. JR.	2	6
GEOS	4593	INTRO TO GPS AND GNSS	Organized	LIMP, WILLIAM F. JR.	2	6
GEOS	4793	GEOSPATIAL UAS	Organized	LIMP, WILLIAM F. JR.	1	3
GEOS	5293	INTRO TO GPS AND GNSS	Organized	LIMP, WILLIAM F. JR.	6	18
GEOS	5543	GEOSPATIAL APPLICATIONS	Organized	LIMP, WILLIAM F. JR.	11	33
GEOS	5553	SPATIAL ANALYSIS USING AR	Organized	LIMP, WILLIAM F. JR.	6	18
GEOS	5593	INTRO TO GEODATABASES	Organized	LIMP, WILLIAM F. JR.	4	12
GEOS	5793	GEOSPATIAL UAS	Organized	LIMP, WILLIAM F. JR.	2	6
				TOTAL FOR THIS INSTRUCTOR .....	100	300
GEOS	1131L	EARTH SCIENCE LAB	Organized	LINCK, RACHEL F.	45	45
				TOTAL FOR THIS INSTRUCTOR .....	45	45
GEOS	4533	INTRO TO PETROL GEOPHYSIC	Organized	LINER, CHRISTOPHER L.	6	18
GEOS	5533	INTRO TO PETROL GEOPHYSIC	Organized	LINER, CHRISTOPHER L.	7	21
GEOS	700V	DOCTORAL DISSERTATION	Individualized	LINER, CHRISTOPHER L.	1	6
				TOTAL FOR THIS INSTRUCTOR .....	14	45
GEOS	600V	MASTER'S THESIS	Individualized	MANGER, WALTER L	5	13
				TOTAL FOR THIS INSTRUCTOR .....	5	13
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	MCGILVERY, THOMAS A.	1	3
GEOS	4253	PETROLEUM GEOLOGY	Organized	MCGILVERY, THOMAS A.	4	12
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	MCGILVERY, THOMAS A.	1	3
GEOS	5743	PETROLEUM GEOLOGY	Organized	MCGILVERY, THOMAS A.	7	21
GEOS	600V	MASTER'S THESIS	Individualized	MCGILVERY, THOMAS A.	2	8
				TOTAL FOR THIS INSTRUCTOR .....	15	47
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	MORGAN, KIRSTY P.	43	43
				TOTAL FOR THIS INSTRUCTOR .....	43	43
GEOS	1131L	EARTH SCIENCE LAB	Organized	NAGY, KRISTINE M.	65	65
				TOTAL FOR THIS INSTRUCTOR .....	65	65
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	OEFINGER, JORDAN A.	66	66
				TOTAL FOR THIS INSTRUCTOR .....	66	66
GEOS	3023	INTRO TO CARTOGRAPHY	Organized	PARADISE, THOMAS R.	25	75
GEOS	4043	GEOGRAPHY OF MIDDLE EAST	Organized	PARADISE, THOMAS R.	23	69
GEOS	4043H	HONORS GEOG OF MIDDLE EAS	Organized	PARADISE, THOMAS R.	18	54
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	PARADISE, THOMAS R.	1	3
GEOS	5183	GEOGRAPHY OF MIDDLE EAST	Organized	PARADISE, THOMAS R.	2	6
GEOS	550V	INTERN IN GIS & CARTOGRAP	Individualized	PARADISE, THOMAS R.	1	3
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	PARADISE, THOMAS R.	7	20
GEOS	600V	MASTER'S THESIS	Individualized	PARADISE, THOMAS R.	1	3
GEOS	700V	DOCTORAL DISSERTATION	Individualized	PARADISE, THOMAS R.	2	15
				TOTAL FOR THIS INSTRUCTOR .....	80	248
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	PATTERSON, RUBY V.	44	44
				TOTAL FOR THIS INSTRUCTOR .....	44	44
GEOS	2313	MINERALOGY & PETROLOGY	Organized	POTRA, ADRIANA	33	99
GEOS	4083	ECONOMIC GEOLOGY	Organized	POTRA, ADRIANA	3	9
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	POTRA, ADRIANA	1	3
GEOS	4982H	SENIOR HONORS II	Individualized	POTRA, ADRIANA	1	2
GEOS	5283	ECONOMIC GEOLOGY	Organized	POTRA, ADRIANA	4	12
GEOS	600V	MASTER'S THESIS	Individualized	POTRA, ADRIANA	1	3
				TOTAL FOR THIS INSTRUCTOR .....	43	128
GEOS	600V	MASTER'S THESIS	Individualized	SHARMAN, GLENN R.	1	3
				TOTAL FOR THIS INSTRUCTOR .....	1	3
GEOS	4223	STRATIGRAPHY/SEDIMENTANT	Organized	SHAW, JOHN B.	6	18
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	SHAW, JOHN B.	3	9
GEOS	600V	MASTER'S THESIS	Individualized	SHAW, JOHN B.	3	12
				TOTAL FOR THIS INSTRUCTOR .....	12	39

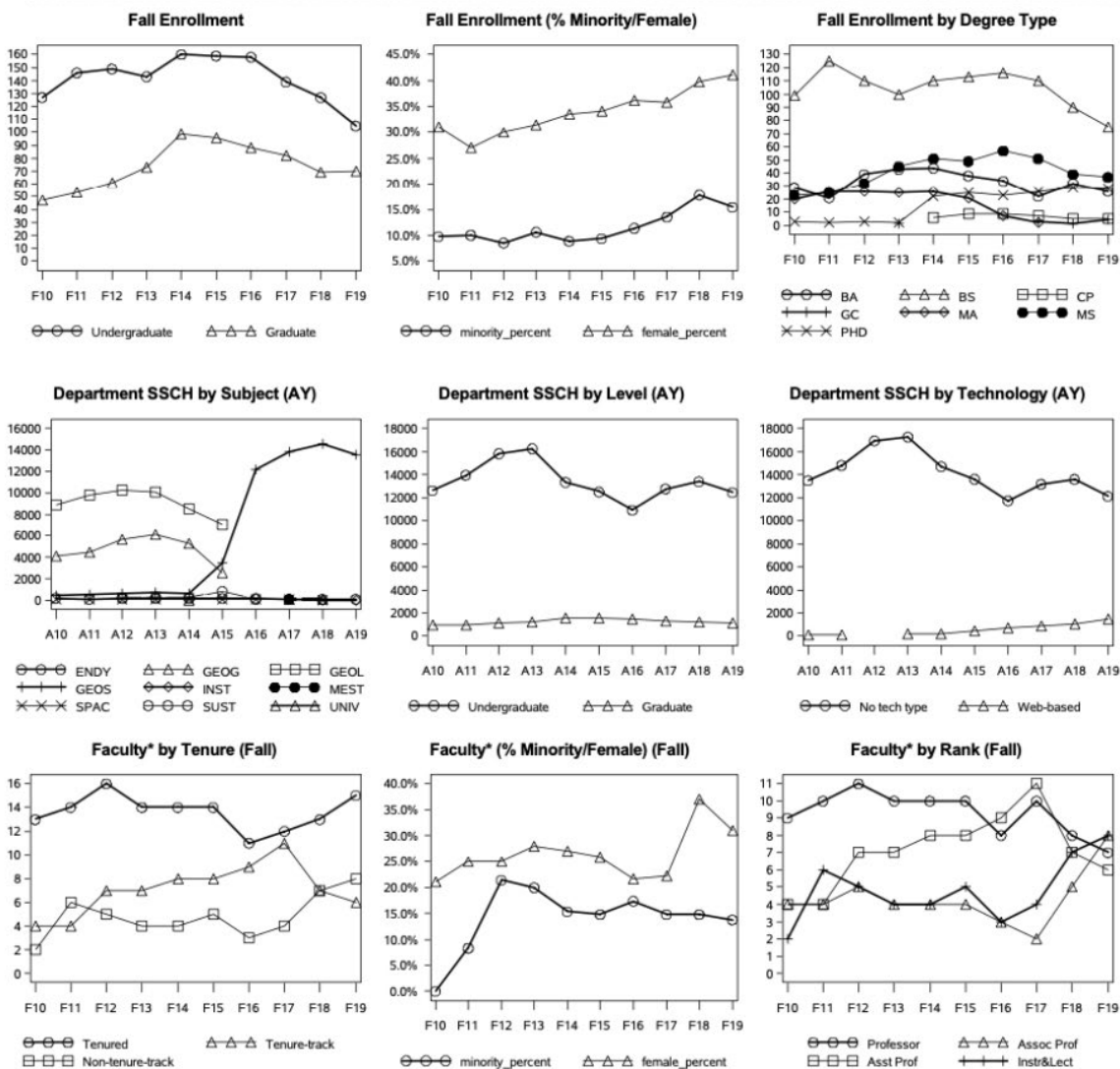
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GEOS	1133	EARTH SCIENCE	Organized	STAHLE, DAVID W.	142	426
GEOS	410V	SPECIAL PROBLEMS IN GEOS	Individualized	STAHLE, DAVID W.	2	6
GEOS	4972H	SENIOR HONORS I	Individualized	STAHLE, DAVID W.	1	2
GEOS	5011	COLLOQUIUM	Organized	STAHLE, DAVID W.	15	15
GEOS	700V	DOCTORAL DISSERTATION	Individualized	STAHLE, DAVID W.	2	7
				TOTAL FOR THIS INSTRUCTOR .....	162	456
GEOS	360V	UNDERGRAD SPECIAL PROBLEM	Individualized	SUAREZ, CELINA A.	1	2
GEOS	510V	SPEC PROB GEOSCIENCES	Individualized	SUAREZ, CELINA A.	1	2
GEOS	700V	DOCTORAL DISSERTATION	Individualized	SUAREZ, CELINA A.	1	9
				TOTAL FOR THIS INSTRUCTOR .....	3	13
GEOS	3103	GEOSPATIAL COMPUTING TOOL	Organized	TULLIS, JASON A.	5	15
GEOS	4413	PRINCIPLES OF REMOTE SENS	Organized	TULLIS, JASON A.	6	18
GEOS	5073	GEOSPATIAL COMPUTING TOOL	Organized	TULLIS, JASON A.	3	9
GEOS	5213	PRINCIPLES OF REMOTE SENS	Organized	TULLIS, JASON A.	9	27
GEOS	5793	GEOSPATIAL UAS	Organized	TULLIS, JASON A.	2	6
				TOTAL FOR THIS INSTRUCTOR .....	25	75
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	TURNER, HENRY L. III	44	44
GEOS	1113	GENERAL GEOLOGY	Organized	TURNER, HENRY L. III	171	513
GEOS	1113H	HNRS GENERAL GEOLOGY	Organized	TURNER, HENRY L. III	9	27
				TOTAL FOR THIS INSTRUCTOR .....	224	584
GEOS	1113	GENERAL GEOLOGY	Organized	TURNER, STEPHANIE K.	133	399
				TOTAL FOR THIS INSTRUCTOR .....	133	399
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	WHITE, TRAVIS G.	67	67
				TOTAL FOR THIS INSTRUCTOR .....	67	67
GEOS	560V	GRADUATE SPECIAL PROBLEMS	Individualized	WOOLSEY, JAMIE A.	15	45
				TOTAL FOR THIS INSTRUCTOR .....	15	45
GEOS	1111L	GENERAL GEOLOGY LAB	Organized	ZAPP, SAMUEL M.	46	46
				TOTAL FOR THIS INSTRUCTOR .....	46	46
				TOTAL FOR THIS ALPHA CODE .....	2,858	6,782
				TOTAL FOR THIS DEPARTMENT .....	2,869	6,818

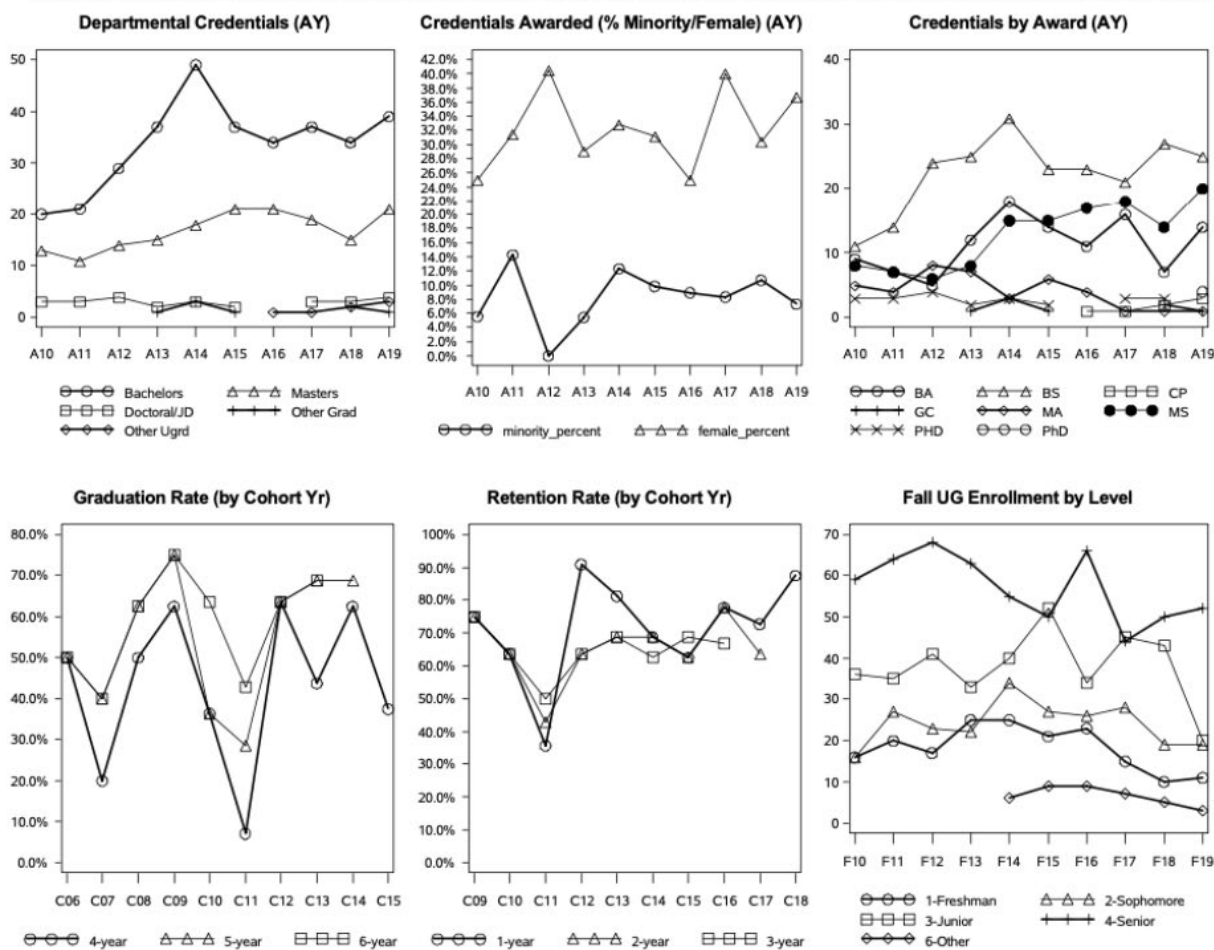
C.9. Research Awards

Department	Role	Name	Sponsor	Fiscal Year							Grand Total
				2014	2015	2016	2017	2018	2019	2020	
GEOS	PI	Aly, Mohamed	NASA	\$19,033							\$19,033
GEOS	PI	Aly, Mohamed	NASA			\$28,274	\$18,274				\$46,548
GEOS	PI	Aly, Mohamed	NASA				\$10,000				\$10,000
GEOS	PI	Blackstock, Joshua	Evolving Earth Foundation			\$1,930					\$1,930
GEOS	PI	Boss, Steve	National Science Foundation			\$15,000					\$15,000
GEOS	PI	Boss, Steve	National Science Foundation				\$35,000				\$35,000
GEOS	PI	Boss, Steve	National Science Foundation					\$38,000			\$38,000
GEOS	PI	Boss, Steve	National Science Foundation	\$50,000							\$50,000
GEOS	PI	Boss, Steve	National Science Foundation							\$99,973	\$99,973
GEOS	PI	Boss, Steve	National Science Foundation							\$49,413	\$49,413
GEOS	PI	Boss, Steve	National Science Foundation				\$49,800				\$49,800
GEOS	PI	Boss, Steve	National Science Foundation						\$349,801		\$349,801
GEOS	PI	Cothren, Jackson	BASF Corporation (USA)				\$220,000				\$220,000
GEOS	PI	Cothren, Jackson	U.S. Department of Energy						\$119,431		\$119,431
GEOS	PI	Cothren, Jackson	U.S. Department of Agriculture						\$211,992		\$211,992
GEOS	PI	Cothren, Jackson	U.S. Department of Energy						\$364,231		\$364,231
GEOS	PI	Cothren, Jackson	U.S. Department of Agriculture						\$0		\$0
GEOS	PI	Cothren, Jackson	American Council of Learned Societies						\$9,900		\$9,900
GEOS	PI	Cothren, Jackson	National Science Foundation					\$158,762			\$158,762
GEOS	PI	Cothren, Jackson	U.S. Department of Energy						\$205,000		\$205,000
GEOS	PI	Cothren, Jackson	Arkansas Game and Fish Commission	\$10,923							\$10,923
GEOS	PI	Covington, Matthew	Arkansas Department of Higher Education				\$2,750				\$2,750
GEOS	PI	Covington, Matthew	National Science Foundation			\$262,037				\$0	\$262,037
GEOS	PI	Covington, Matthew	National Science Foundation						\$72,234		\$72,234
GEOS	PI	Davidson, Fiona	Arkansas Department of Higher Education	\$2,125							\$2,125
GEOS	PI	Davis, Ralph	Santee Sioux Tribe of Nebraska			\$40,000					\$40,000
GEOS	PI	Dumond, Gregory	National Science Foundation		\$98,458	\$128,455					\$226,913
GEOS	PI	Dumond, Gregory	National Science Foundation				\$322,864		\$219,430		\$542,294
GEOS	PI	Dumond, Gregory	National Science Foundation			\$46,000					\$46,000
GEOS	PI	Feng, Song	National Science Foundation					\$299,088			\$299,088
GEOS	PI	Feng, Song	National Science Foundation				\$74,724				\$74,724
GEOS	PI	Feng, Song	National Science Foundation	\$184,138							\$184,138
GEOS	PI	Feng, Song	Korea Polar Research Institute	\$48,000	\$45,558	\$43,184					\$136,742
GEOS	PI	Fernandes, Katia	International Center for Tropical Agriculture							\$26,388	\$26,388
GEOS	PI	Guccione, Margaret	Flat Earth Archeology, LLC				\$3,119				\$3,119
GEOS	PI	Hameed A. Naseem	The American Chestnut Foundation				\$2,000				\$2,000
GEOS	PI	Hays, Phillip	U.S. Environmental Protection Agency	\$17,000							\$17,000
GEOS	PI	Limp Jr., Fred	Historic Arkansas Museum					\$75,000			\$75,000
GEOS	PI	Limp Jr., Fred	Arkansas Natural & Cultural Resources Council					\$90,000			\$90,000
GEOS	PI	Limp Jr., Fred	U.S. Department of Interior-National Park Service	\$300,378							\$300,378
GEOS	PI	Manger, Walter	Devon Energy Corporation		\$27,210						\$27,210
GEOS	PI	Max Phillip Cooper	Southeastern Cave Conservancy					\$2,500			\$2,500
GEOS	PI	Myre, Joe	National Science Foundation	\$6,000							\$6,000
GEOS	PI	Paradise, Thomas	National Science Foundation						\$46,000		\$46,000
GEOS	PI	Paradise, Thomas	National Science Foundation			\$46,000	\$46,000				\$92,000
GEOS	PI	Paradise, Thomas	National Science Foundation						\$32,776		\$32,776
GEOS	PI	Potra, Adriana	Arkansas Science & Technology Authority		\$92,116						\$92,116
GEOS	PI	Potra, Adriana	UALR - Arkansas Space Grant Consortium				\$5,000				\$5,000
GEOS	PI	Sharman, Glenn	California Resources Corporation						\$35,000	\$35,000	\$70,000
GEOS	PI	Sharman, Glenn	The Petroleum Research Fund, American Chemical Society							\$110,000	\$110,000
GEOS	PI	Sharman, Glenn	Devon Energy Corporation					\$135,000			\$135,000
GEOS	PI	Shaw, John	Chancellor's Innovation Fund						\$118,250		\$118,250
GEOS	PI	Shaw, John	National Science Foundation						\$180,924		\$180,924
GEOS	PI	Shaw, John	Arkansas Department of Higher Education					\$2,125			\$2,125
GEOS	PI	Shaw, John	The Petroleum Research Fund, American Chemical Society				\$110,000				\$110,000
GEOS	PI	Shaw, John	National Science Foundation			\$6,000					\$6,000
GEOS	PI	Shaw, John	National Science Foundation					\$50,000			\$50,000
GEOS	PI	Shaw, John	U.S. Department of Energy				\$447,953	\$107,521	\$97,424		\$652,898
GEOS	PI	Shi, Xuan	National Institutes of Health					\$210,151			\$210,151
GEOS	PI	Shi, Xuan	National Institutes of Health	\$38,336	\$38,337						\$76,673
GEOS	PI	Shi, Xuan	National Science Foundation		\$99,933						\$99,933
GEOS	PI	Simon, Katie	University of Cincinnati				\$14,090				\$14,090
GEOS	PI	Stahle, David	National Science Foundation	\$219,650				\$0			\$219,650
GEOS	PI	Stahle, David	National Science Foundation		\$418,656						\$418,656
GEOS	PI	Stahle, David	Oak Hill Fund					\$20,000			\$20,000
GEOS	PI	Stahle, David	Arkansas State Parks					\$5,000			\$5,000
GEOS	PI	Suarez, Celina	National Science Foundation							\$587,991	\$587,991
GEOS	PI	Suarez, Celina	Department of Interior					\$10,649			\$10,649
GEOS	PI	Suarez, Celina	National Science Foundation					\$352,690			\$352,690
GEOS	PI	Suarez, Celina	American Geosciences Institute			\$6,738					\$6,738
GEOS	PI	Tullis, Jason	AmericaView							\$23,500	\$23,500
GEOS	PI	Tullis, Jason	U.S. Geological Survey						\$23,500		\$23,500
				\$815,627	\$900,224	\$628,737	\$1,356,455	\$1,556,486	\$2,085,893	\$932,265	\$8,275,687

C.10. Fulbright College Geosciences Department Profile



Notes: -Enrollment is based on fall census date total enrollment and includes students active in a major academic plan associated with this department as either first or second major or in an interdisciplinary major and the student's advisor or committee chair has this department as their primary academic department.  
 -SSCH are student semester credit hours based on classes attributed to this department. Classes are generally assigned to a department based on the academic organization to which the subject of the class is associated in ISIS. Classes identified as interdisciplinary are assigned to the primary academic department of the instructor. Interdisciplinary classes with multiple instructors have their SSCH divided equally among the departments of the instructors.  
 \*-Faculty counts include instructional faculty only and are divided by AAUP ranks. Distinguished and university professors are included in the professor rank. Faculty with a clinical modifier are included in the instructor rank. Faculty with a title modifier of adjunct, visiting, or executive in residence are included in the lecturer rank.  
 -Source: Office of Institutional Research AHEIS archives.



Notes: -Credential counts are based on total degrees and certificates awarded during an academic year. They include credentials for which either the first, second, or third major of graduating students was linked to this department.  
 -Graduation and retention rates are based on a cohort of students that were first-time, full-time degree-seeking students during the fall of their cohort year. Departmental cohorts are cohort members whose primary major on the census date of the fall semester of their first year is owned by this department. In the case of engineering departments, cohort members since 2007 have been placed into a department based on the first major with which they begin a fall or spring semester after moving out of the freshman engineering academic plan if that major is within the College of Engineering.  
 -Source: Office of Institutional Research AHEIS archives.



U Arkansas Department of Geosciences Self-Study Report 2020

		AY Credential Counts					Fall Faculty* Counts		
		BACH	MAST	DOC/JD	OTHER	TOT	T/TT	NTT	TOT
2010	Male	13	11	3	.	27	14	1	15
	Female	7	2	0	.	9	3	1	4
	Minority	1	0	1	.	2	0	0	0
	<b>Total</b>	<b>20</b>	<b>13</b>	<b>3</b>	<b>.</b>	<b>36</b>	<b>17</b>	<b>2</b>	<b>19</b>
2011	Male	15	9	0	.	24	15	3	18
	Female	6	2	3	.	11	3	3	6
	Minority	4	1	0	.	5	1	1	2
	<b>Total</b>	<b>21</b>	<b>11</b>	<b>3</b>	<b>.</b>	<b>35</b>	<b>18</b>	<b>6</b>	<b>24</b>
2012	Male	18	7	3	.	28	19	2	21
	Female	11	7	1	.	19	4	3	7
	Minority	0	0	0	.	0	5	1	6
	<b>Total</b>	<b>29</b>	<b>14</b>	<b>4</b>	<b>.</b>	<b>47</b>	<b>23</b>	<b>5</b>	<b>28</b>
2013	Male	26	12	0	1	39	17	1	18
	Female	11	3	2	0	16	4	3	7
	Minority	2	1	0	0	3	3	2	5
	<b>Total</b>	<b>37</b>	<b>15</b>	<b>2</b>	<b>1</b>	<b>55</b>	<b>21</b>	<b>4</b>	<b>25</b>
2014	Male	36	11	1	1	49	18	1	19
	Female	13	7	2	2	24	4	3	7
	Minority	5	3	1	0	9	3	1	4
	<b>Total</b>	<b>49</b>	<b>18</b>	<b>3</b>	<b>3</b>	<b>73</b>	<b>22</b>	<b>4</b>	<b>26</b>
2015	Male	27	14	1	0	42	18	2	20
	Female	10	7	1	1	19	4	3	7
	Minority	5	1	0	0	6	3	1	4
	<b>Total</b>	<b>37</b>	<b>21</b>	<b>2</b>	<b>1</b>	<b>61</b>	<b>22</b>	<b>5</b>	<b>27</b>
2016	Male	26	16	.	0	42	17	1	18
	Female	8	5	.	1	14	3	2	5
	Minority	3	2	.	0	5	3	1	4
	<b>Total</b>	<b>34</b>	<b>21</b>	<b>.</b>	<b>1</b>	<b>56</b>	<b>20</b>	<b>3</b>	<b>23</b>
2017	Male	22	12	2	0	36	19	2	21
	Female	15	7	1	1	24	4	2	6
	Minority	4	1	0	0	5	3	1	4
	<b>Total</b>	<b>37</b>	<b>19</b>	<b>3</b>	<b>1</b>	<b>60</b>	<b>23</b>	<b>4</b>	<b>27</b>
2018	Male	19	14	3	3	39	15	2	17
	Female	15	1	0	1	17	5	5	10
	Minority	5	0	1	0	6	3	1	4
	<b>Total</b>	<b>34</b>	<b>15</b>	<b>3</b>	<b>4</b>	<b>56</b>	<b>20</b>	<b>7</b>	<b>27</b>
2019	Male	23	13	4	3	43	15	5	20
	Female	16	8	0	1	25	6	3	9
	Minority	3	2	0	0	5	3	1	4
	<b>Total</b>	<b>39</b>	<b>21</b>	<b>4</b>	<b>4</b>	<b>68</b>	<b>21</b>	<b>8</b>	<b>29</b>

## **Appendix D. Program 2012-2013 Review Responses**

### **Area of Concern Identified by Geosciences External Reviewers and Included in the Report of the Review Committee**

#### **1. Program specific curriculum would benefit majors**

Each of the degree programs reviewed BA Geography, BS Geology, BS Earth Sciences, MA Geography, and MS Geology have a unique curriculum as indicated in the University of Arkansas Undergraduate and Graduate Catalog of studies. There is currently a faculty committee appointed to review the BA Geography requirements to make them slightly more prescriptive and provide the skill set necessary for our students to be competitive for graduate school admittance or employment upon graduation. The BS in Geology has been relatively prescriptive for decades, but with the large number of new faculty hires a thorough review of the breadth of courses and sequencing of courses is needed. At the graduate level, both the MA and MS are well defined and routinely reviewed. The course offerings at all levels have been reviewed annually by our Geosciences External Advisory Board, with a view from the industry perspective. The board has made suggestions on ways to strengthen the curriculum to help meet industry needs which the Department has tried incorporating as new faculty have been hired.

#### **2. Career advising directly by Geosciences faculty would benefit students**

The University shifted to centralized advising of undergraduate students in the recent past. However, many students continue to seek advising directly from Departmental faculty, which is encouraged within the Department. Several faculty routinely advise students as requested about career opportunities, including the Department Chair and the primary undergraduate and graduate advisors. We do not meet with each undergraduate major individually to discuss these career options, but we do meet directly with each of the MA and MS students as part of the graduate program process to discuss career options. In addition, members of our External Advisory Board hold informational sessions in the fall each year to discuss various career paths with our students. These events are well advertised but attendance is voluntary, so the students must take the initiative to participate to gain the benefit.

#### **3. Recommendation to appoint primary faculty advisor for each degree program**

Each degree program has a primary faculty contact. Dr. Doy Zachry is the primary contact for the Geology BS, and is the graduate coordinator for the Geology MS; Dr. Fiona Davidson is the primary contact for the Geography BA, and is the graduate coordinator for the Geography MA. Dr. Ralph Davis and Dr. John Dixon are the primary faculty contacts for the Earth Sciences BS. However, students are encouraged to meet with faculty they are comfortable interacting with, and each faculty member in the Department has been advised that they should be capable of providing advice and guidance to students within their respective areas of expertise. Many of our students join the program during their sophomore year and thus require some manipulation

of course sequencing to get through the program in a reasonable time frame. This duty generally falls on the primary advisors and the Department Chair.

#### **4. Graduate student handbook needs updating as a guidance tool**

There is a graduate student handbook for the MA and MS programs, but is in need of an update. Each student cohort entering the graduate program starting in fall 2004 was issued a copy of the handbook. However, it became apparent through advising that the students were not reading the material provided, so no handbook was issued to the cohorts entering the program in fall 2012 or fall 2013. The first week of each fall semester is a period of extensive graduate student orientation. We require incoming graduate students to attend both of the orientation sessions offered by the Graduate School and provide our own orientation session during that week as well. Given an expressed concern we will update and issue the graduate student handbook with the fall 2014 cohort and continue to emphasize the importance of attending the Graduate School and Departmental Orientation sessions.

#### **5. Develop capstone courses in geology and geography at the undergraduate level**

The Geography BA curriculum is being reviewed by a faculty committee with an explicit goal of making the required courses slightly more prescriptive and adding a capstone course for the Geography BA. The required 6-hour Geology Summer Field camp serves as a capstone course for the Geology BS. The last major modification of the Geology BS curriculum shifted Earth Systems History to a senior level course with an intent of making this a capstone experience, but it has not really worked out as envisioned. A review of the undergraduate curriculum for the Geology BS is needed especially given the large number of junior faculty hired on this side of the program in the last several years.

#### **6. Incorporate more quantitative components in courses**

The Department of Geosciences is experiencing a generational turnover in faculty. Many faculty have been hired at the junior level in geography and geology in the last several years. As these faculty take over the core major's curriculum the courses will be upgraded to current quantitative standards. Many courses offered as part of the upper level electives in both majors are very quantitative, however, often the students do not choose to participate in the more rigorous electives. The Geology BS does require that the students take a quantitative course in Geological Data Analysis and that the students take either Geochemistry or Geophysics. Both of these were incorporated during the last major revision to the Geology BS, which occurred in 2006. Strengthening the quantitative aspects of the Geography BA will be an outcome of the current curricular review and modification.

#### **7. Provide additional opportunities for undergraduate research interaction**

Geosciences faculty interact with undergraduates in the Honors program to fulfill their thesis requirements. This includes undergraduate students in the four-year Honors College Program



and those seeking Departmental Honors. These students are encouraged to seek either undergraduate research grants through the competitive SURF undergraduate research program or through resources provided by the Honors College. The students who participate in these programs are paired with research active faculty and their graduate students to carry out their research and complete their undergraduate theses. More general inclusion of undergraduate students in faculty research has been on an ad-hoc basis. Several faculty provide modest pay for undergraduates to assist in their laboratories with mineral separation and sample preparation. In general, there has not been a formal mechanism to encourage undergraduate research beyond those seeking honors. There are several Research Experience for Undergraduates programs on campus, including a REU related to sustainable ecological services. Additional advertising of available REU's along with targeted outreach to the undergraduates about potential external REU's would likely help increase overall numbers of undergraduate students involved in research.

#### **8. Provide better coordination between large introductory lecture sections and the laboratory**

The Department has a laboratory coordinator designated for the 35 to 45 sections of Introductory physical geology offered each semester. Dr. Henry Turner, one of our faculty Instructors is assigned this duty. There are five sections of the introductory geology lecture offered each fall and four each spring. The course services over 2000 students each year. Four instructors teach the introductory lecture sections and twelve graduate teaching assistants teach the laboratory sections. Textbooks in the lecture sections and in the laboratory sections are common for all sections. Additional emphasis will be placed on sequencing of lecture material and the laboratory. Standardization of the syllabi for the laboratories will be completed. This will be accomplished via the Department Chair and the introductory laboratory coordinator.

#### **9. Review laboratory manual for introductory physical geology**

The textbook for the introductory physical geology course was reviewed by a faculty committee and a new text was selected for implementation in the fall 2013, after over 18 years with the previous text. A similar faculty committee vetting of available laboratory manuals occurred in 2006. The current laboratory manual was selected based on a recommendation from the faculty review committee. It is likely time to again conduct a review of available laboratory manuals for this course. However, it is essential that the laboratory coordinator require the adherence by the teaching assistants to the material presented in the laboratory manuals. The Department Chair will work with the laboratory coordinator to generate a standard laboratory syllabus and to be certain that the teaching assistants are following the syllabus and utilizing the laboratory manual.

#### **10. Incorporate local field trip for introductory geoscience courses**

The Department incorporated a local walking field trip for introductory physical geology in the past but the logistics of providing this opportunity to 2000 students per year became unrealistic

to accomplish. There are no plans to generate a new field trip option for this course. The students who take the freshman level Environmental Geology course, which generally has enrollment of about 100 students each semester, do take several local field trips. Each of these field trips has an associated exercise. One looks at dendrochronology and how research sampling occurs, one investigates watersheds, streamflow and wetlands, one visits the sewage treatment plant. Each of the major's courses in geology beginning with Mineralogy/Petrology incorporate a local/regional field trip as part of the course. Generally, these trips occur over a weekend departing late on a Friday afternoon and returning late Saturday evening or Sunday mid-afternoon. We also offer a week-long field experience to various parts of the southwest U.S. during spring break each year. The trips recently have rotated between Big Bend National Park in Texas; a north-south transect of the Rio Grande Rift, Guadalupe Peak and Carlsbad Caverns; Canyon Lands and Arches National Parks in Utah; and the Grand Canyon area. There are no immediate plans to incorporate additional field experiences.

#### **11. Provide ice-breaker bonding experience to new and returning students at the start of the fall semester**

The Department offers an ice-breaker picnic for returning graduate students at the start of each fall semester. We have not tried to provide a field excursion as part of this ice breaker. Identifying a field experience of common interest across the very diverse spectrum of graduate students in the department has proven elusive and may be unattainable. The recommendation is lofty but likely cannot be achieved as the wants and desires of students in various aspects of the program are so disparate as to not create a common theme upon which to build such a field experience. As example, the geologists like to look at rocks in outcrop while the human geographers might find a museum visit or a visit to a cultural setting more appealing. Trying to force this commonality at the graduate level is not likely to be beneficial. We have discussed and struggled with these concepts over the years since being merged but have not yet identified a viable solution. We will add this as a point of discussion for a planned Departmental retreat scheduled for mid-October 2014.

#### **12. Reduce teaching loads to 3 per year (2 and 1) rather than 4 per semester (2 and 2) as is the current load**

A 2-2 teaching load per year has been the standard in Geosciences for at least the past twenty years, and is generally the standard throughout the University. Newly hired faculty are provided a course load reduction during their first year, only being assigned one course. The 2-2 load does begin with their second year. Reducing the load would indeed provide more focus for research production. One mechanism to help has been to move most of the introductory course load to instructors rather than tenure-track faculty, who are teaching mainly upper division undergraduate and graduate courses. Modification of the curriculum and alternate sequencing of courses will be required to reduce the teaching load to 2-1. This will be brought to the table as an agenda item at the faculty retreat scheduled for mid-October 2014.

**13. Increase graduate student stipends to regional average at a minimum**

The Department has been requesting an increase in graduate stipends for decades and will continue to do so. We are non-competitive for external offers for graduate assistantships and our offers are routinely rejected. We have worked closely with our alumni base to provide endowed scholarship resources to help supplement the graduate stipends. This has been successful for targeted scholarships on the energy related side of the geology program and to a lesser extent for the environmental side of the geology program, but has not yet seen success for the geography program. Having said this, even with scholarship supplements ranging from \$1,500 to \$5,000 per year the stipends still remain below the regional average.

**14. Increase salaries for departmental administrative personnel**

Yes, this needs to be done. We have tried to elevate our administrative personnel to the highest rank possible. Other mechanisms for adjusting classified pay are largely out of our control at the Departmental level. Our administrative personnel all perform at very high levels and routinely receive excellent rankings which provide the basis for the highest possible annual pay adjustment. We will continue to advocate for better pay for our administrative personnel.

**15. Provide dedicated technical support for research laboratories to reduce burden on faculty thus increasing their overall research productivity**

This is a critical missing component of University infrastructure that is not currently sufficient. The science has moved in the last several decades to high performing laboratories with sophisticated complex instrumentation. This is true both in geology and geography. Maintenance and operation of much of the equipment requires specific technical skills and time. Time devoted by individual faculty to this activity is time not devoted to research productivity (grant writing and completion of publications). To be competitive at the top 50 public research university level it is essential that dedicated technical support be provided. We continue to recommend this type of support for our high-end analytical laboratories including the MC-ICPMS facility, and our computing facilities where complex dedicated software packages are installed in support of geoinformatics, geophysical data processing, and water resources modeling. We do not have the resources at the Departmental level to provide this technical support. Grant funded resources can only provide a very modest level of support for these technical aspects, and generally on a limited time scale. It is essential that the University identify resources to support a quality dedicated technical staff.

**16. Review course offerings across the curriculum in light of the large number of newly hired junior faculty**

This is being done for the Geography BA program during the summer of 2014 and for the Geography MA program as part of a faculty driven goal of shifting this from an MA to an MS in Geography. A review of the Geology BS and Geology MS are needed and will be completed

during the 2014 academic year. Discussion of this will be included as an agenda item for the faculty retreat scheduled for mid-October 2014.

**17. Accept graduate students only if there is an identified graduate advisor**

The model used for the Geosciences PhD program is that there must be a willing graduate faculty advisor identified at the time of admittance to the program. The model for the Geography MA and Geology MS programs has been to admit all students meeting the minimum requirements for Graduate School admission who do not have significant program deficiencies. Geography MA and Geology MS acceptance into the program is completed via the respective graduate coordinator. Teaching assistantship offers are vetted through faculty committees for each degree program. It is not anticipated at this time that the open enrollment at masters level for those students meeting the graduate school requirements and not having significant program deficiencies will change. This will be included as an agenda item for the faculty retreat scheduled for mid-October 2014.

**18. Develop a strategic plan**

The Department strategic plan is in need of an update. A primary objective of the previous plan was to gain a PhD program in Geosciences. This goal has been achieved and is now being implemented. A second goal was to devise a hiring strategy for a significant number of faculty retirements facing the department. Several of these faculty replacements have occurred and several more will occur in the next two to five years. A new strategic plan is needed to focus on curricula modifications, implementation of the PhD program, future faculty hires, and overall program direction. The faculty held two retreats in the last 10 years, one in 2005 and one in 2011. We are scheduled for another faculty retreat in mid-October 2014. It is overdue, especially with the large number of faculty hired in the last several years. Development of the goals and objectives for a new departmental strategic plan will be one of the primary outgrowths of this faculty retreat.

## **Appendix E. Department Diversity and Inclusion Plan**

### **Geosciences Diversity and Inclusion Plan**

DRAFT pending approval of Vice Chancellor's office

The Geosciences program is the oldest STEM discipline at the university, established in 1887. The department offers BS degrees in Geology, Geography, and Earth Sciences; MS degrees in Geography and Geology, and a PhD in Geosciences. It participates in interdisciplinary doctoral degree programs in Environment Dynamics and Space and Planetary Sciences. The department is already very active in diversity and inclusion initiatives. As a result, the program's student diversity has been increasing since the department initiated an aggressive recruitment and mentoring strategy in 2003. For example, In 2009 and 2019, the department hosted the annual meeting of the National Association of Black Geoscientists and established a student chapter of NABG and it has since become one of the most active student chapters in the U.S. Currently, there are 11 students in the organization, and annually 6-11 University of Arkansas students attend the annual technical conference of NABG. University of Arkansas underrepresented minorities (URMs) have successfully transitioned to the geosciences workforce and several have prominent roles in NABG nationally.

In 2010, the University of Arkansas entered into a cooperative agreement with Fort Valley State University (an 1890 Land-Grant HBCU in Fort Valley, GA) to develop 3+2 dual degree programs in Chemistry-Geology and Mathematics-Geology. For this program, FVSU students complete BS degrees in Chemistry or Mathematics in 3 years at FVSU, and then transfer to the University of Arkansas where they complete requirements for a BS degree in Geology in two additional years of study. The department has successfully graduated 4 students from this partnership. An unanticipated benefit of our association with the program at FVSU is matriculation of MS students who complete BS degrees in Geology at another partner institution, Penn State University. To date, 4 students have earned BS Geology degrees at Penn State University then matriculated in the MS Geology program at the University of Arkansas. Three of those students have graduated and are employed in the energy industry and two are active members of NABG. One student was the first Geosciences PhD student in departmental history to earn an NSF Graduate Research Fellowship, and he has since taken full-time employment in the energy sector in Houston.

In 2011, the department partnered with the Math, Science, and Engineering Academy (MSEA) at Fort Valley State University. MSEA is a pre-college program that identifies talented URM students in 8th grade and offers them summer enrichment academic programs throughout their high school careers. Currently, the Department of Geosciences partners with the College of Engineering to host rising high school juniors (11th grade) in MSEA each summer for a 1-week residential program on the University of Arkansas campus. Students learn about hydrogeology

and karst geomorphology of northwestern Arkansas and biofuels synthesis and hydroelectric power generation in the College of Engineering. Sponsorship of the summer pre-college MSEA program is from FVSU, the Fulbright College of Arts & Sciences, the College of Engineering, and the Graduate School and International Education. Annually, student enrollment varies and has ranged from 15 to 32 since 2011.

The Department of Geosciences also participates in several Research Experience for Undergraduates (REU) programs on the University of Arkansas campus each summer and these have been venues to recruit and retain URMs through our other partnerships.

Thus, since 2003, the department has developed a full complement of educational opportunities for URMs interested in geosciences degrees and career opportunities, beginning with partnership in a summer pre-college program, undergraduate baccalaureate program, summer REUs, MS geology degree, and PhD in Geology/Geoinformatics, Environmental Dynamics, or Space and Planetary Science (see Appendix).

Nevertheless, there is still much more that the department could do to increase the participation of diverse groups at the undergraduate, graduate and faculty levels given that the geosciences are one of the least diverse STEM sciences. Our intention in creating this Diversity and Inclusion plan is to explore the ways in which the department can create and operationalize opportunities for faculty, staff and students to increase their awareness of and sensitivity to bias and discrimination as well as finding ways in which the department can increase the inclusion and visibility of underrepresented groups in the department. The plan aims to enhance opportunities for personnel and students to participate in a more diverse community through revising hiring practices, enhancing teaching materials and more carefully considering the way in which underrepresented groups are made visible in the physical and virtual spaces of the department.

## **Goals and Outcomes**

Short-term goals and Outcomes:

- a. Increase visibility of diverse groups within the department.
- b. Increase participation of diverse geoscientists in department activities such as colloquium.
- c. Increase representation of diversity in the curriculum, especially in introductory classes.
- d. Increase diversity of colloquium speakers.
- e. Increase awareness of diversity and inclusion among the faculty/staff and students.
- f. Create a structure to ensure diversity on faculty committees.

- g. Develop an inclusive strategy for departmental social events.
- h. Develop a strategy for combating implicit bias against underrepresented groups in the department.

#### Medium term goals

- a. Increase diversity in the faculty through strategic hiring.
- b. Increase underrepresented groups in the graduate and undergraduate programs through targeted recruiting.

#### Long term goals

- a. Develop funding sources to support faculty and student engagement in diverse research communities.
- b. Develop funding sources to support underrepresented groups in the graduate and undergraduate programs.

### **Aligning Plans with Principles**

#### **Action Plan 1**

1. Personalized Learning opportunities for faculty, staff and students
  - a. The department will require all faculty and staff to attend Diversity and Inclusion training once every three years. This training will include both Implicit Bias Training and Bystander Intervention Training. Training is provided by the University of Arkansas and the department Diversity and inclusion Committee will send reminders with links to sign up for training at the beginning of each semester. These reminders will be sent to faculty/staff who are due to undertake training and they will have to confirm with the Diversity and Inclusion Committee that the training was successfully completed.
  - b. The department will require all graduate students in teaching and/or supervisory roles to attend Diversity & Inclusion training in their first semester with the department. If the student's tenure lasts longer than three years, they will be required to refresh that training in their fourth year.
  - c. Provide a list of national and regional training opportunities on the department's Diversity and Inclusion webpage (see 7c). Provide financial and logistical support to permit faculty/staff and students to take advantage of these opportunities (see 4).

- d. Department staff will keep records of faculty/staff and graduate student attendance at the required training to be included in the annual Diversity and Inclusion report.

### **Action Plan 2**

2. Opportunities for engagement with people of diverse backgrounds.
  - a. The department's partnership with Fort Valley State (GA) shall be continued to ensure the success of the 3+2 dual degree program in MATH-GEOL which enables 2-3 students of color to transfer to the U of A each year to complete the GEOS portion of their degree.
  - b. The department's strong relationship with NABG (the National Association of Black Geoscientists) shall be continued by participating in the organization's annual meeting and sponsoring a U of A chapter of the organization.
  - c. The department and faculty advisers will encourage and support faculty and graduate students to attend and participate in diversity events at national and regional conferences and to reach out to students in underrepresented populations.
  - d. The department will encourage faculty and students to attend conferences targeted towards diverse research populations; targeted conferences would include NABG, SACNAS, AWG, Geoscience Alliance and oSTEM
  - e. The department will create a Diversity and Inclusion webpage (See 7c) to maintain a list of events, conferences and conference special events that provide opportunities for engagement with diverse groups.
  - f. Faculty will be encouraged to include any such activities in their annual review summaries.

### **Action Plan 3**

3. Efforts to ensure inclusion and diversity as a universal value of the campus community through active measures.
  - a. All faculty will be encouraged to examine their classes for opportunities to increase the diversity of representation in their curriculum and instruction. For example, including researchers from diverse backgrounds in their reading lists and lectures and including perspectives of and impacts on diverse populations



when discussing environmental, social, economic and political issues relevant to Geosciences.

- b. This curriculum development should be included in annual review summaries and will be rewarded appropriately at the departmental and college level.
- c. The department, through the new standing committee for Diversity and Inclusion, will create an ongoing seminar program to train students in professional development; this program will be specifically structured to encourage professional development in underrepresented groups, including first generation undergraduates.
- d. The department will continue to deemphasize the use of standardized testing for admissions in the graduate programs with the goal of eventually removing the GRE requirement for all but DAF/DDF candidates.
- e. All faculty and staff search committees will discuss candidate information with the Chair of the Diversity and Inclusion Committee to ensure that underrepresented groups are given adequate representation in short lists, specifically the top ten and top three lists that are used to screen the most qualified candidates for faculty positions.

#### **Action Plan 4**

4. A budget that reflects a commitment to inclusion and diversity.
  - a. The D&I Committee will submit a budget, no later than September 15<sup>th</sup> each year, outlining necessary expenditures for the year.
  - b. Department leadership will work with the advisory board to raise foundation funds to support underrepresented students.
  - c. The department will dedicate global campus funds (from teaching online classes) towards supporting faculty and student travel to regional and national conferences that focus on underrepresented groups and towards supporting travel to local, regional and national training events.
  - d. The department will create a dedicated budget to fund faculty and or staff, as well as students, to attend targeted conferences and non-research-focused undergraduate institutions for recruiting diverse students.

### **Action Plan 5**

5. Access to a network of resources to support an inclusive climate.
  - a. The department, through the Diversity and Inclusion Committee, will build and maintain a database of Geosciences-related teaching materials that enhance diversity and inclusion in the curriculum. These resources will be made available to all faculty to encourage the creation of more diverse teaching materials.
  - b. The Diversity and Inclusion Committee will also create a calendar of events, focusing on diversity-related conferences and training opportunities, to facilitate faculty participation in national and regional diversity opportunities.

### **Action Plan 6**

6. Opportunities to enhance intercultural competency and diversity. The geosciences are well suited to enhance intercultural competency and diversity due to the global nature of the discipline. The department plan to enhance intercultural competency and diversity in the following ways:

- a. Faculty will be strongly encouraged to seek information of historical and cultural significance to disseminate to students as an integral part of all department field activities. Students shall be expected to be cognizant of, and record this information in graded field books.

Most field trip sites are places that we visit multiple times. The departmental D&I committee, with the help of others from the department shall construct an archive of information for all of the commonly visited sites. That information will include the cultural perspective of the sites. For example, the geology field camp class drives to Montana every summer. We stop at various sites consistently and make observations about geology along the way. We will also include cultural perspective for these sites and expect the students to record this information in their graded field books. For example, we stop at Red Rocks Amphitheater outside Denver, CO and discuss the geologic history of the site. Red Rocks is also an important cultural site for the indigenous people. It has been occupied since Paleolithic times and the site was sacred to the Ute Tribe of Colorado. We will explain how the unique geology of the Front Range affected the development of indigenous society in the area, how the geology influenced the Gold Rush and resulted in conflicts between the Native people that used the area and the encroaching Euro-Americans. This is just one example and an online file will be kept for the sites per class for instructors to access and incorporate into their classes.

- b. The department will identify a departmental hourly work study student to help the D& I Committee and relevant faculty collect the above information and keep the archive current. The cost of such activities will be included in the annual budget submitted by the D&I Committee to the Chair.
  
- c. Geography includes classes that have explicitly cultural, political and social content (World Regional Geography; Human Geography, Political Geography, Urban Geography, Geography of Europe, Geography of the Middle East). These classes are already structured in a way that emphasizes the contributions of diverse geographers in the readings/content and that highlight issues that are of importance to diverse communities. For example, Urban Geography includes a focus on the impacts of gentrification on inner city neighborhoods in US cities; Geography of Europe includes a component on immigration and refugees in Europe, as well as a section on the diverse nature of European cities.
  
- d. Faculty will be encouraged to, and rewarded if they do, update all syllabi and course materials to include and emphasize diverse figures in the discipline, especially for the required core courses of General Geology, Human Geography, World Regional Geography and Earth Science. For example, the work of Yi-Fu Tuan in behavioral geography and Marilyn Raphael in climatology; Marie Tharp in the discovery of plate tectonics or James W. Harrington in the development of regional labor markets in urban geography. Alternatively, geologic or geographic influences on cultural history may be included in introductory courses. For example, the Black Belt of the Southeastern US is named for the rich black soils developed on Cretaceous chalk deposits. These soils were the principle locus of plantation agriculture and slavery in the US and remain the counties with the highest population of African Americans in the US Southeast.
  
- e. All faculty will be encouraged to increase the diversity of research voices and experts in their class materials as well as to increase discussions of material that engages with the experiences of diverse communities. Efforts to engage in this material should be noted in the curriculum development section of annual reviews, for consideration by the department Personnel Committee and will be rewarded as part of the teaching component. Faculty will be encouraged to share this material in an online file that can be accessed by the rest of the department.

**Action Plan7**

- 7. Efforts to ensure the unit's space reflects a commitment to inclusion and diversity.

- a. The department will coordinate with Facilities Management to create hallway displayed departmental posters for research and diversity that feature noted Geoscientists and includes representatives from a variety of underrepresented groups.
- b. The D&I Committee will work with other units in the building to increase the visibility of diverse faculty, researchers and students in shared spaces – for example working with the Honors College to create a display space for diversity outside the primary lecture auditorium in Gearhart Hall.
- c. The department’s virtual space, that is the website, will be updated to include the department’s diversity mission statement regarding diversity and inclusion, which will be prominently displayed on the main page, emphasizing the department’s ongoing commitment to creating an inclusive and diverse community in Geosciences. In addition, the Diversity and Inclusion Committee will work with the department technology staff to create a specific Diversity and Inclusion webpage for the department. This page will showcase faculty and students in the department who are doing work that engages diverse communities (for example, work on the geography of voter suppression, or work on climate change hazards in communities of color.) However, it will also showcase the diverse group of scientists and students working in the department. The page will also serve as a host site for Diversity and Inclusion resources that are available either at the University of Arkansas or through national and international geosciences organizations.
- d. In collaboration with Department faculty staff and students the D&I Committee will also draw up a list of inclusive post-colloquium venues for social events and make the list available. Inclusivity in this case should include a commitment to ensuring that most department social events are family and non-alcohol friendly.

### **Action Plan 8**

8. Commitment to establish and maintain professional practices and conduct reflective of an inclusive University of Arkansas community.
  - a. The Department will create a standing committee for Diversity & Inclusion, composed of faculty, staff and graduate students. This committee should be composed of a diverse group, including but NOT LIMITED TO members of underrepresented groups. This Committee will be appointed each year by the

Chair of the Department in consultation with members of the previous year's committee.

b. The Diversity and Inclusion Committee will conduct a department wide diversity/inclusion climate survey at the beginning of **every** academic year. This survey will be administered to all faculty/instructors and staff as well as to majors/minors and graduate students in the geography, geology and earth science undergraduate degrees; students in the Geography and Geology MS programs, and all PhD students in the Geosciences, Space and Planetary Science and Environmental Dynamics programs, who are supervised from within the Department of Geosciences. The results of that survey will be reported in the annual Diversity and Inclusion report and will be used to modify the Diversity and Inclusion plan as appropriate.

c. The Diversity and Inclusion Committee will develop diversity guidelines for critical departmental committees, for example, Personnel and faculty search committees. These guidelines will be advisory to the Department Chair and may be included in a revised Diversity and Inclusion plan at the end of the first year and compliance with these guidelines may be assessed and included in the annual Diversity and Inclusion report.

d. The department will establish a peer-review process to assess teaching to offset implicit bias against underrepresented groups in Purdue evaluations. Faculty and instructors will be able to choose to participate in this process (it will not be mandatory) and will be able to choose their evaluator from a list of three or four sub-discipline-appropriate choices along with a member from Wally Cordes Teaching and Faculty Support Center. Teaching will be assessed in person, by the appropriate evaluator at least twice a semester – once for evaluation, then feedback, and re-assessment. The results of this assessment will be included in each faculty member's annual review. In addition, the peer review teaching evaluations will be compared to the Purdue evaluations for each instructor and discrepancies will be included in the Diversity and Inclusion report and faculty/staff annual reports each year as a bench-mark of implicit bias in the evaluation process.

e. The department will ensure that a member of the Diversity and Inclusion Committee is available for consultation in the event of perceived bias in student complaints against teaching assistants, instructors and tenure-track faculty.

Each of these measures, individually and collectively is designed to increase the awareness and commitment of the Department of Geosciences and its personnel, to the ongoing development of increased diversity and inclusion in our programs. To that end the Diversity and Inclusion Committee will submit an annual report to the Department Chair each May 15 and to Fulbright College, detailing the following:

- a. The results of the annual climate survey.
- b. The progress made on each of the action plans.
- c. Reasons for lack of progress, if appropriate.
- d. Suggestions for modifying any one of the action plans on the basis of information from the climate survey and/or previous year's experience with operationalizing the plan.
- e. Records of faculty/staff and graduate student training.
- f. Updated demographics for the department's students and faculty/staff populations.
- g. Guidelines for committee composition and assessment of committee diversity after the first year.

**Appendix F. Department Personnel Document**

Personnel Document

DRAFT pending approval by UA legal office

On Evaluative Criteria, Procedures and General Standards for Initial Appointment, Successive Appointments, Promotion, Tenure,

Annual Review, and Post-Tenure Review of Faculty

And for Appointment and Annual Review of Non-Classified Staff

Department of Geosciences

This document governs the Department of Geosciences (hereafter Department) in the selection, retention, promotion, granting of tenure to, and evaluation of faculty and in the selection and evaluation of non-classified staff, effective \_\_\_\_\_. It has been approved by the faculty of the J. William Fulbright College of Arts and Sciences, the Dean, the Provost, the Chancellor, and the President of the University of Arkansas, as indicated by the signatures below.

These policies are required to be consistent with the policies of the university as set forth in Board of Trustees policy 405.1 and in three campus policy statements: (1) Evaluative Criteria, Procedures and General Standards for Initial Appointment, Successive Appointments, Promotion and Tenure, (2) University Professorships, and (3) Distinguished Professorships. In case of conflict, the board policy, the campus policy, the school, college, or library policy, and the Department policy shall have authority in that order. Copies of these documents are available online at the UA web site <https://provost.uark.edu/policies/index.php>

It is the policy of the University of Arkansas, Fayetteville to provide equal employment opportunity to all qualified persons; to prohibit discrimination against any employee or applicant for employment because of race, color, religion, sex, age, national origin, sexual orientation, marital or parental status, veteran's status, or disability, and to promote the full realization of equal employment opportunity through a positive, continuing program of affirmative action.

**APPROVALS**

\_\_\_\_\_  
Department Chair Date

\_\_\_\_\_  
Dean Date

\_\_\_\_\_  
Provost Date

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Chancellor

Date

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President

Date

## **Department of Geosciences**

### **Criteria, Procedures, and Standards for Initial Appointment, Evaluation, Reappointment, Post-Tenure Review, Promotion, and Tenure**

#### **Introduction**

The J. William Fulbright College of Arts and Sciences seeks excellence in its faculty and programs in accordance with the standards of the larger scholarly community to which it belongs. Faculty and staff of the College are expected to perform their duties according to the standards of their disciplines or professions and in accordance with commonly accepted ethical and professional practices of the larger academic community.

The College seeks to develop and sustain nationally and internationally prominent programs in teaching and research or creative activity. A faculty dedicated to high national standards is essential to this effort. The College's standards for promotion and tenure reflect these high expectations. Attainment of tenure requires that a high standard for performance be met in research or creative activity, teaching, and service; merely good or satisfactory performance is insufficient to achieve tenure. There must also be a clear indication that such a level of performance will be maintained over a career as a faculty member at the University.

Decisions regarding appointment, evaluation, and promotion of faculty shall reflect the institution's mission, goals, and resources, as well as the quality of performance of all duties associated with a faculty member's appointment. The College fully supports the University's policy to provide equal employment opportunity to all qualified persons; to prohibit discrimination against any employee or applicant for employment because of race, religion, sex, age, national origin, sexual orientation, marital or parental status, veteran's status, or disability, and to promote the full realization of equal employment opportunity through a positive, continuing, program of affirmative action.

This personnel document is consistent with the provisions of the Fulbright College personnel document, Board of Trustees Policy 405.1, and Academic Policy Series 1405.11 (Revised April



13, 2019, hereafter APS 1405.11) for approval through campus processes and by the President of the University of Arkansas System. This document identifies evaluative criteria and standards specific to the Department and any procedures needed to implement the procedures specified in other policies. In the event of any conflict between Department personnel documents and Board, University, or College policies, the Board, University, or College policies shall take precedence.

Ranks and titles used by the College, including those of non-teaching faculty, are defined by Board of Trustees Policy 405.1. (see also Academic Policy Series 1435.50).

### **Department Responsibilities**

The Personnel Committee is an elected departmental committee that evaluates both tenure-track (TT) and non-tenure-track (NTT) candidates for purposes of promotion and tenure. The Personnel Committee shall also serve as the unit peer review committee to conduct annual peer review of TT and NTT faculty as allowed by APS 1405.11 section III.C.1. The Personnel Committee is composed of five elected faculty members elected from the two primary divisions within the Department (geography and geology). The term of appointment on the Personnel Committee is two years staggered so that three members are elected in one year, two in the next, three in the next, and so forth.

Full time Department faculty members at or above the rank of associate professor are eligible to serve on the Personnel Committee, with three exceptions: (1) Department Chair (hereafter Chair), (2) a faculty member who has received notification of non-reappointment or termination, and (3) visiting faculty members. A member of the Personnel Committee shall not vote on promotion and tenure for any candidate at a rank higher than the committee member's rank, except that tenured and tenure-track professors shall be allowed to vote on candidates for University Professor and Distinguished Professor.

See APS 1405.11 section IV.B.12.d for modified rules if the Department includes at least two NTT faculty members of associate rank or above, a situation that does not currently apply to the Department.

Personnel Committee elections will be completed by April 15. When electing members of the Personnel Committee, fulltime Geosciences faculty at or above the rank of assistant professor are eligible to vote, with three exceptions: (1) Chair, (2) a faculty member who has received notification of non-reappointment or termination, and (3) visiting faculty members.

The Personnel Committee shall participate in the annual review of each faculty member's performance in accordance with the provisions of the APS 1405.11 section III.B.

When voting as a member of the Personnel Committee, a member may cast one of two legitimate votes: Yes (affirmative) or No (negative). When any committee member believes they have a

conflict of interest with regard to any candidate, the committee member shall state that such a conflict exists and shall recuse from all discussion and voting on that candidate. The recusing committee member shall be absent from the meeting during discussion and voting on that candidate. The committee member is not obligated to state the nature of the conflict of interest. When counting and recording committee votes, any recusing member shall be considered as absent for that vote, reducing the total recorded committee vote by the number of recusals.

The Department maintains a personnel file for each member of the staff holding faculty rank. Together, the Fulbright College and departmental personnel files constitute the official record of each faculty member's employment.

Faculty work assignments are a specific responsibility of the Chair. Assignments will be made by the Chair based on the best interests and needs of the Department and the institution. The Chair is also responsible for overseeing the post-tenure review process in accordance with the provisions APS 1405.11 section III.E.

### **Faculty Responsibilities**

Members of the faculty are expected to adhere to current university policies relevant to their responsibilities and to meet professional standards in performing their duties. Failure to do so will be reflected in annual merit evaluations.

### **I. Initial Appointment**

Section II of APS 1405.11 describes the campus's criteria and procedures for the initial appointment of all faculty members, and instructs the faculty and Chair of each department to adopt criteria and procedures for initial appointments appropriate to their discipline and consistent with Board and University policies, including Academic Policy 1435.50. Section II of APS 1405.11 also describes types of academic titles and the typical length of appointment for non-tenure-track faculty. Departmental criteria and procedures for initial appointment must be approved by the dean, the Provost and Executive Vice Chancellor for Academic Affairs (hereafter referred to as Provost), the Chancellor and the President, and shall be incorporated in each department's statement of "Criteria, Procedures, and Standards." The Chair shall consult with the department faculty prior to making a recommendation for initial appointment. As part of this consultation, the Chair may conduct a non-binding vote of the tenured and tenure-track faculty. Pursuant Section II.B. of "Evaluative Criteria," initial appointments of new tenured or tenure-track faculty members must be voted on by the Personnel Committee and Tenured Faculty Committee; initial appointments of new non-tenure-track faculty members must be voted on by the by the Personnel Committee and Promoted Faculty holding at least the rank to which the faculty member is being considered.

## **II. Successive Appointments and Annual Review**

Section III of APS 1405.11 describes the campus's standards and procedures regarding successive appointments and annual review and instructs the faculty and Chair of each department to adopt criteria and procedures for an annual review and evaluation of the work and status of each member of the department. These criteria and procedures shall be consistent with those described in APS 1405.11 section III.A-F.

The following statements provide specific Department policies consistent with the campus policy.

### **A. Weighting of Workload Assignments**

Faculty members will normally be evaluated on the basis of teaching, research or creative activity, and service with a weighting of 40% for teaching (including advising and thesis/dissertation supervision), 40% for research/creative activity, and 20% for service, regardless of the percent of appointment to each activity. Other weightings may be assigned by the Chair with the concurrence of the faculty member and the approval of the dean.

### **B. Annual Review for All Faculty**

In addition to APS 1405.11 section III.B., the annual evaluation of each faculty member submitted by the Department Chairperson and Personnel Committee will include an evaluation of the individual's performance in each of the areas included in their workload assignment (typically research/creative activity, teaching, and service), as well as an overall evaluation of their performance during the year. In each performance area, the individual's performance will be rated according to the following scale: "exceeds expectations," "meets expectations fully," "minimally meets expectations," and "does not meet expectations."

An overall rating of each individual's performance shall be made according to the same scale. The overall rating may reflect aspects of an individual's performance germane to an evaluation of her or his professional responsibilities, but not belonging solely to one or more of the areas included in the workload assignment. This may include an individual's demonstrated ability to work productively with colleagues in carrying out the research/creative, teaching, and service missions of the department and the College.

The Chair's ratings shall be accompanied by an expository statement analyzing each individual's performance in each area and overall.

Evaluations and evaluation procedures will be conducted with integrity, respect, fairness, trustworthiness, and transparency to ensure courtesy, equity, and fairness for all faculty members and to comport with institutional values and policies concerning professional ethics, law and policy on discrimination, harassment, and bullying.

Evaluation Scale:

- 0 – Does not meet expectations
- 1 – Minimally meets expectations
- 2 – Meets expectations fully
- 3 – Exceeds expectations

Evidence of achievement in teaching should include the level and type of courses taught, the course delivery method, and faculty time devoted to teaching and/or advising. Each faculty member must participate in the University's student evaluation process, although student evaluations will be only one instrument used to measure teaching effectiveness. In addition to student evaluations, faculty must also provide at least one additional item of evidence from APS 1405.11 section III.F.1.a,b,or c. Refusal to participate in the student evaluation process, or to submit grades according to stated deadlines, will result in a rating of "does not meet expectations" in teaching.

Further with regard to evaluation in the area of teaching, APS 1405.11 section II.B.8 states: "Student evaluations of teaching shall be made fully available to the faculty member. The numerical ratings from student evaluations of teaching shall be made fully available to any persons conducting the annual review. Students' narrative comments from evaluations shall be made fully available to the faculty member's unit chairperson/head". The Department Chair will review student narrative comments from evaluations only in the following situations:

- a) If numerical ratings from student evaluations of teaching for a particular course are significantly below the Department average, Department Chair may call a meeting with teaching faculty member at which student narrative comments from evaluations for only that specific course will be jointly reviewed as part of a discussion whether a teaching improvement plan is warranted.
- b) If any student narrative comments from evaluations are disclosed by a faculty member in documentation for annual review, 3<sup>rd</sup> year review, or promotion and tenure review, then all comments must be included. Chair may review all student narrative comments for that faculty member over the time period of the review to confirm completeness of the disclosed comments.

Submission of an annual resume update is an integral part of the evaluation process. Failure to submit an annual resume update will result in an overall annual rating of "does not meet expectations."

With regard to "Post-Tenure Review," described in section III.E of "Evaluative Criteria," an overall unsatisfactory rating taking into consideration the assigned workload and overall contributions to the unit will result in placing the tenured faculty on a remediation plan. Section III.E also stipulates that failure either to attain an overall satisfactory performance rating or to demonstrate meaningful progress in remediating the overall performance deficiencies at the time of next annual evaluation, the faculty member may be issued a notice of dismissal on twelve months' notice as provided for in Section VI of "Evaluative Criteria," and subject to the procedures contained in UA Board Policy 405.1.IV.C.

The performance improvement plan may also be initiated by the Dean's Office when a faculty member receives an unsatisfactory rating in any of the three workload categories (research, teaching, and service).

## **C. Criteria and Standards**

### **1. Criteria**

#### Research/Creative Activity

Faculty are expected to establish and maintain an active program of research/creative activity. Supporting evidence of an active program includes the following: publications of papers, books and similar items, awards, including funding of research proposals by external agencies after competitive review, an active program funded or unfunded, papers presented at professional meeting, seminars, and other professional forums, technical reports on research projects completed or in progress, and/or professional recognition by outside agencies, private companies, groups, or other individuals in the field.

#### Teaching

Faculty are expected to teach across all levels within the Department as assigned by the Chair. Normal teaching loads within the Department are two (2) courses per semester during the 9-month academic year. Other teaching duties may be assigned by the Chair to meet the best interests and needs of the Department and the institution. Supporting evidence of teaching includes the following: Teaching materials such as course outlines, examinations, and supplementary materials, demonstrated effectiveness in direction of undergraduate, graduate, and postdoctoral students, participation in departmental examination activities, such as written or oral examinations for honors or graduate degree candidates, high standards in course content and student assessment, and/or conduct of successful classes gathered by direct observation by Chair and peers.

#### Service

Faculty are expected to provide academically related service to the Department, University, and the Profession. Supporting evidence of academically-related service activities may include: Activities intended to enhance public understanding of the University and to develop the service function, involvement in the work of professional societies, committee activity at the University, participation in activities in connection with funding agencies, and/or service to the public through consulting or other activities in the area of academic or professional competence of the faculty member.

## **2. Standard for Evaluation**

### **a) Research**

0 – no published papers, books or similar items; no active program; no generation of external resources; no awards; no recognition by outside entities.

1 – published in non-peer reviewed literature and/or low impact journals; limited citations; no generation of external resources; limited active program.

2 – published in peer-reviewed literature with acceptable impact; average citations; sufficient external resources to maintain research program.

3 – published in high impact peer-reviewed journals; high citation index; significant external resources to support a well rounded research program.

### **b) Teaching**

0 – no teaching; no curriculum development; no thesis supervision/committee appointments; no advising; no evaluations.

1 – teaches at one level; minimal curriculum revision; no thesis supervision but does serve on committees; minimal advising; minimal evaluations.

2 – teaches at more than one level; regular curriculum review and revision; thesis supervision and service on thesis committees; regular advising; average evaluations.

3 – teaches across all levels; new course development; thesis advising at all levels including matriculation of advisees; abundant undergraduate advising; outstanding evaluations.

### **c) Service**

0 – no Departmental, College or University committee appointments; no outreach; no professional service.

1 – one committee appointment; limited outreach; limited professional service.

2 – mix of committee appointments; responds regularly to outreach requests; regular external peer review of grants, articles, programs.

3 – committee work at all levels with leadership; initiates outreach and promotes the Department, College and University; leadership and long-term professional positions.

### **III. Promotion**

Section IV of APS 1405.11 describes the university's standards and procedures regarding promotion and governs promotions within Fulbright College. (Academic Policy Series 1405.13, describes the review process and suggested documentation for appointment to the ranks of University and Distinguished Professor.) The following statements are intended to guide implementation of the campus policies.

#### **A. Process**

1. Each promotion candidate will be reviewed by the Departmental Personnel Committee, as defined in the section on Departmental Responsibilities. The Personnel Committee makes a non-binding recommendation to the Chair. The vote of the Department Personnel Committee shall be recorded and entered in the appropriate University form for inclusion in the candidate's promotion packet.
2. The performance of each faculty member shall be reviewed by the Chair. A comprehensive cumulative record of annual review forms and summaries of annual discussions with the Chair shall be maintained and shall be made available to the faculty member upon request. These records shall form the principal, but not sole, basis for promotion considerations.
3. With the help of the Departmental Personnel Committee, the Chair shall begin in the Spring semester of each year consideration of whom to nominate for promotion that year. Discussions with faculty members who may wish to be evaluated for promotion will be a consideration. No later than May 1, the Chair shall inform in writing, each faculty member who is being considered for promotion that he or she is being considered. No later than May 5, any faculty member (whether so informed or not) may request in writing to the Chair to be nominated for promotion that year. Such request shall be honored by the Chair.
4. The Chair shall ask each individual nominated for promotion to submit material which will facilitate consideration of competence and performance. Written evaluations of that material from at least three persons, at peer or more prestigious institutions (R1 institutions), with appropriate expertise to assess the candidate's professional accomplishments shall be obtained (see APS 1405.11 section IV.B.10.f). A minimum of three (3) letters from impartial outside reviewers at peer or aspirant institutions will be included. External reviewers should possess credentials that will demonstrate their expertise in evaluating the impact of the candidate's work within the context of the discipline. Impartial outside reviewers are those who lack a familial relationship with the candidate, who lack a former student/teacher relationship with the candidate, who have not collaborated on grants or publications, and who lack any apparent or actual conflict of interest. The candidate shall not solicit or contact potential or actual external reviewers (APS 1405.11 section IV.B.10.f.i).

To assist in maintaining reviewer confidentiality, the candidate and the department Personnel Committee will each identify four (4) or five (5) appropriate reviewers. (The department Personnel Committee may, at their discretion, seek suggestions from the Department Chair about potential reviewers.) The candidate will be shown the complete list of potential reviewers and can strike any 2 reviewers within 5 business days of seeing the list. The departmental Personnel Committee will select a minimum of 3 reviewers from the combined accepted lists, including at least one reviewer from the candidate's list and at least one from the Personnel Committee list. The candidate will not be told of the final composition of the list of reviewers (APS 1405.11 section IV.B.10.f.iii). The final selection will be made by the Departmental Personnel Committee.

5. The department Chair is responsible for contacting the final list of reviewers using a College template letter that includes a confidentiality statement (APS 1405.11 section IV.B.10.f.v). The Chair solicitation letter content is to be made available to the candidate before it is sent to prospective external reviewers.

All external reviewer letters received must be included in the packet along with a short vita or bio for each from the external reviewers indicating areas of expertise, scholarly achievements and stature in the discipline. Candidates have the right to review the comments/written narratives of the external reviewers' letters. However, the reviewers' identifying information (letterhead, signature, etc.) will be redacted to provide the reviewer some confidentiality.

In the event a candidate requests a copy of an external review letter under the Arkansas Freedom of Information Act, s/he would be entitled to receive a copy of the unredacted recommendation as a part of their personnel file (APS 1405.11 section IV.B.9).

6. A candidate's success in the areas of teaching, research/creative activity, and service (APS 1405.11 section IV.A.) depends on the candidate's demonstrated ability to interact productively with students, as well as to work productively with colleagues in carrying out the research/creative, teaching, and service missions of the Department and the College. Evidence of these abilities will be considered in the promotion review process. The grounds for a recommendation against promotion on this basis must be clearly documented, and the candidate must have an adequate opportunity to understand and to respond to such concerns.

7. The Personnel Committee recommendation, outside reviewer letters, tenured faculty vote, and any other relevant material shall be utilized by the Chair in deciding whether to make a positive or negative recommendation. (A "positive recommendation" is a recommendation to promote; a "negative recommendation" is a recommendation not to promote.)

8. The Chair shall inform the faculty member of this recommendation and the rationale for it.



9. Prior to the time the Chair forwards the nomination the dean, the faculty member may withdraw from further consideration. Such withdrawal shall be in writing to the Chair.

10. Each nomination shall be forwarded to the dean in writing by the Fulbright College deadline (currently early October) and shall be accompanied by the Chair's recommendation, all materials provided to the Chair by the faculty member, and all other materials evaluated by the Chair. Any recommendations shall also be accompanied by a written rationale.

11. A maximum of three written statements to correct errors of fact or to update the promotion and tenure packet are allowed as described in APS 1405.11 section IV.B.9.

### **B. Appeal**

Except for non-reappointment, dismissal, tenure, or promotion decisions, a faculty member claiming that an evaluation or recommendation resulting from the annual review process violates their rights under established University personnel regulations, policies, or practices, has recourse through written appeal to the dean. This written appeal may request reconsideration of the evaluation by the dean, based on specific, articulated concerns. The dean shall make the final determination on the annual review. For non-reappointment, dismissal, tenure, or promotion decisions, other University policies and procedures are applicable.

### **IV. Tenure**

Section V of APS 1405.11 describes the university's standards and procedures regarding the awarding of tenure, including probationary period suspension procedures and policies concerning mandatory tenure reviews and terminal appointments. Section III.D. of "Evaluative Criteria (Third Year Review for Tenure Track Faculty) and Sections III.1-4 above apply also to the tenure review process.

Suspension of the probationary period shall be granted in accordance with the provisions of section V.C of "Evaluative Criteria."

#### **A. Third-Year Review**

A written review of progress toward tenure shall be made of each person on the tenure track no later than the end of the third year of the candidate's probationary period. This third-year review shall be made on the basis of a review of annual evaluations and an interview with the candidate, and may include other relevant material such as a report of an observation of the candidate's teaching or a review of the candidate's scholarship to date by an external evaluator.

As a reminder, promotion and tenure are not automatic based on years of service or performance that is merely satisfactory. Rather, in the pursuit of excellence, promotion and tenure are based on high levels of achievement and the trajectory toward sustained success over a career. Third year review dossiers should utilize standard promotion and tenure packets. All dossiers should include material documenting the following:

1. Progress in teaching including student feedback
2. Progress in all service activities
3. Progress in scholarship including external funding

Each non-tenured, tenure-track faculty member will undergo a third-year review conducted by the Departmental Personnel Committee and the Chair. That committee will review the professional career of the candidate and assess progress toward a positive recommendation for tenure, and will provide advice and analysis based on the review to the faculty member and the Chair. The Chair will submit a written review for inclusion in the candidate's file and remit a copy to the dean.

Assessment of performance in the third-year review includes three options:

1. Currently making satisfactory progress - appointment is continued for 4th and 5th years, subject to all University policies;
2. Appointment is continued for 4<sup>th</sup> year, subject to all University policies and a required 4th year review. Department Chair/Head will address weaknesses;
3. Notice of non-reappointment, subject to procedures outlined in Board Policy 405.1.IV.B, with the 4th year as the terminal year.

## **B. Tenure Evaluation**

No later than May 1, the Chair will inform in writing each faculty member who is being considered for tenure. No later than May 5, any non-tenured, tenure-track faculty member may request in writing to the Chair that he or she be considered for tenure in that year.

## **C. Appeals**

1. A faculty member not recommended for tenure may request that the committee of tenured faculty reconsider that recommendation based on the evidence previously provided. That person may appear personally before the committee. The Chair shall consider the recommendation of the committee in making his or her recommendation to the Dean.

Appeals procedures above the Department level are described in APS 1405.11 section VII.B.

## **V. Dismissal**

Dismissal proceedings shall be conducted in accordance with the provisions of APS 1405.11 section VI.

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## Appendix G. Active External Advisory Board Members – 2019-2020

Mr. Heath Wallis, Chair of the Board Tulsa, OK	Mr. Drew Kreman Geologist, Chesapeake Energy Oklahoma City, OK	Mr. Maurice Storm President, Tecolote Energy Tulsa, OK
Mr. Bill Coffey, Past chair Oklahoma City, OK	Mr. Randy Lawson Chairman & CEO Lawco Energy Bentonville, AR	Mr. Eddie Valek Exploration Manager, EOG San Antonio, TX
Mr. Mark Cooper, Chair Elect President, Buffalo Data Services Fayetteville, AR	Mr. Mike Liebelt Houston, TX	Mrs. Cathy Voight Fayetteville, AR
Mr. Matt Boyce Houston, TX	Mr. Robert Liner Geology Manager, Stephens Production Fort Smith, AR	Mr. Daniel Wagner Hydrologist, U.S.G.S. Fayetteville, AR
Mr. Will Cains Oklahoma City, OK	Mr. Gerry Lundy Honorary Member Hogback Exploration Inc. Fort Smith, AR	Mr. Alex Warmath Honorary Member CTO, Sr. VP, Greenfields Energy Houston, TX
Mr. Don Castleberry Honorary Member Consultant, Park Protection Associates Maumelle, AR	Elizabeth Lyon Senior Authority for Cartography & Geography, National Geospatial- Intelligence Agency Springfield, VA	Ms. Dawn T. Warrick Planner, Freese and Nichols, Inc. Tulsa, OK
Mr. Garrett Clemons Vice President, Environmental, Health & Safety, NGL Energy Partners LP, TransMontaigne Product Services LLC Denver, CO	Mr. Mike Malloy Director of Economic Development, City of Fairview Heights Fairview Heights, IL	Dr. Devin A. White Manager, Autonomous Sensing and Perception, Pathfinder Technologies Group, Sandia National Lab Albuquerque, NM
Mr. Clayton Yarri Davis Vice President-Exploration, Vitruvian Exploration The Woodlands, Texas	Mr. Shane Matson Honorary Member President, Blue Jacket Energy Tulsa, OK	Mr. Charles W. Wickstrom Managing Member, Iron Hawk Energy, LLC Tulsa, OK
Dr. Tom Freeman Honorary Member Columbia, MO	Ms. Jasmeen Moubarak Shell Production Company Houston, TX	Mr. John G. Williams Honorary Member Managing Director, Lift Energy Partners Houston, TX
Mr. Taylor Friesenhahn Associate, CIBC Grifis & Small Houston, TX	Dr. Michael Ed Ratchford State Geologist & Director Moscow, ID	Mr. William H. Willis Honorary Member
Ms. Melody Hacker Senior Geologist, XTO Energy/ExxonMobil Spring, TX	Mr. Ron Snyder Ceja Corporation/VP Exploration Tulsa, OK	Dr. Edith Wilson Honorary Member Rock Whisperer LLC Tulsa, OK
Mr. Jeffrey D. Hall Honorary Member Edmond, Oklahoma	Mr. Tad Sours Faculty, Haas Hall Academy Fayetteville, AR	Mr. Brett Whitman Houston, TX
Lacie Knight Geos Manager, ALD Operating, LLC Houston, TX		