

April 29, 2016

Chancellor Robert Witt
The University of Alabama System
500 University Boulevard East
Tuscaloosa, AL 35401

Dear Chancellor Witt:

I am pleased to endorse the recommendation from Interim Provost Kevin Whitaker and Deans David Francko and Robert Olin for approval of the attached proposal for a Ph.D. degree in Geography (CIP 45.0701).

If you approve of this proposal, I would appreciate you forwarding this request to the Board of Trustees for their approval.

Sincerely,



Stuart R. Bell
President

Enclosures

c.: Interim Provost Kevin Whitaker
Dean David Francko
Dean Robert Olin



April 29, 2015

President Stuart Bell
The University of Alabama
203 Rose Administration Building
Tuscaloosa, AL 35487

Dear President Bell:

I join Deans David Francko and Robert Olin in recommending for your approval the attached proposal for a Ph.D. degree in Geography (CIP 45.0701). The Graduate Council unanimously approved of this proposal at its meeting on April 26, 2016. This proposed graduate degree program meets specific needs and will attract new graduate enrollments.

If you approve of this proposal, please forward this request to the Chancellor at your earliest convenience.

Sincerely,



Dr. Kevin Whitaker
Interim Provost

Enclosures

c.: Dean David Francko
Dr. Catherine Pagani
Dean Robert Olin

April 27, 2016

Interim Provost Kevin Whitaker
The University of Alabama
Office for Academic Affairs
254 Rose Administration Building
Tuscaloosa, AL 35487

Dear Provost Whitaker:

I join Dean Robert Olin in recommending for your approval of the attached proposal for a Ph.D. in Geography (CIP 45.0701). The Graduate Council unanimously approved of this proposal at its meeting on April 26, 2016. This proposed graduate degree program meets specific needs and will attract new graduate enrollments.

We ask for timely handling of this item so that it may be considered at the June 2016 Board of Trustees meeting.

If you approve of this proposal, please forward this request to President Bell at your earliest convenience.

Sincerely,



Dr. David A. Francko
Associate Provost and Dean of the Graduate School

Enclosures

c.: Dr. Catherine Pagani

THE UNIVERSITY OF ALABAMA

Resolution

Granting Initial Approval of and Permission to Submit to the Alabama Commission on Higher Education (ACHE) a Proposal for a new Doctor of Philosophy in Geography (CIP 45.0701) in the Department of Geography

WHEREAS, the Department of Geography in the College of Arts and Sciences at The University of Alabama currently offers an undergraduate and a master's degree in Geography; and

WHEREAS, the degree program seeks to train and support the professional development of highly skilled, STEM-educated workers to meet the growing academic, governmental, and private-sector demand for scientists focused on human-physical systems; and

WHEREAS, the demand for geographers with strong analytical skills is growing in the government and private sectors, and the Department's graduates are already finding success in a variety of jobs; and

WHEREAS, the strengths of the new Ph.D. will draw on existing faculty expertise in Earth systems and water science policy, among other areas, which will valuably address emerging societal concerns and will contribute to the University's mission of advancing the intellectual and social condition of our world; and

WHEREAS, the Doctor of Philosophy degree in Geography is currently not available at any state, and few regional institutions;

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of The University of Alabama that it grants initial approval of and permission to submit to the Alabama Commission on Higher Education (ACHE) a Proposal for a Doctor of Philosophy in Geography degree (CIP 45.0701) at The University of Alabama.

Alabama Commission on Higher Education

PROPOSAL FOR A NEW DEGREE PROGRAM – NEW APPLICATION TOOL

Please check one: ☐ Baccalaureate Program ☒ Graduate Program

A. General Information

1. Institution: University of Alabama

2. Institutional Contact Person:

Dr. Cathy Pagani

Telephone: 348-8283

Fax: 348-0400

E-mail: cathy@ua.edu

3. Program Identification--

Field of Study/ Program Title: Geography

Degree: Ph.D.

CIP Code: 45.0701

4. Date of Proposal Submission: May, 2016

5. Proposed Program Implementation Date: August 15th, 2017

6. Program Administration:

Name of College/School: UA Arts and Sciences

Name of Dean: Dr. Robert Olin

Name of Department: Geography

Name of Chair: Dr. Douglas Sherman

Note: Please expand all response fields as necessary.

B. Program Purpose and Description

1. In no more than one paragraph describe the purpose of the proposed program. Please also include a brief statement regarding how the program's purpose is related to the University's mission and goals.

The proposed Ph.D. in Geography at the University of Alabama will support the training and professional development of highly-skilled STEM knowledge workers able to meet the growing academic, governmental, and private sector demand for scientists focused on the utilization and management of natural resources within the framework of human-environment interaction. Particular strengths of the program will include a strong emphasis on an Earth systems approach, numerous faculty with expertise in water science and/or policy, and the application of powerful geospatial analytical techniques and technologies to understanding the complex biogeochemical systems that not only sustain environmental and social systems but also pose emerging risks to society. These strengths directly contribute to the University of Alabama's mission "To advance the intellectual and social condition of the people of the State, the nation, and the world..." and will contribute to all four of the University's Strategic Goals.

2. Please provide a description of the specific kinds of employment opportunities, post-graduate professional degree programs, and other graduate programs that will be available to the graduates.

As with most Geography Ph.D. programs the majority of graduates will likely seek employment in academia as tenure-track or research faculty. However, geography Ph.D.s routinely secure employment in various branches of government and increasingly in the private sector (often as research scientists). For example, recent graduates of our M.S. program are employed with federal agencies such as the U.S. Forest Service, and the U.S. Army Corps of Engineers, Alabama state agencies such as the Forestry Commission, and Geological Survey, as well as many municipal governments (e.g., Dothan, Hartselle, Thomasville, and Tuscaloosa) and private businesses (e.g., Alabama Power/Southern Company, Intergraph, and Genwest Systems) in Alabama.

UA's Geography Ph.D. program will prepare students for positions outside academia while also providing training and professional development necessary for students to compete for faculty positions at highly ranked Geography programs in the US and abroad.

The demand for geographers with strong quantitative and analytical skills is growing in the US in both government and the private sector (e.g., section C) and many of our students will no doubt choose to pursue careers in related fields or as is often the case in the geosciences, may maintain positions that straddle both academia and government/private sectors. As of yet a Ph.D. is not commonly required as a condition of employment in many relevant areas outside of academia. However, as is true for many scientific disciplines, the fact that potential employees have demonstrated this much higher level of academic attainment (and consequent understanding of relevant research methods and technologies) will no doubt become more of a deciding factor in non-academic hiring.

3. Succinctly list at least four (4) but no more than seven (7) of the most prominent ***student learning outcomes*** of the program. These outcomes should lend themselves to subsequent review and assessment of program accomplishments.

The National Research Council (2010) has stated that:

Training the next generation of geographical scientists will require an updated curriculum to promote geographical understanding, spatial thinking, and geographical research skills, and to teach students how to make use of recent technological advances.

Our learning outcomes will follow this guidance by requiring students to demonstrate proficiency in four key areas discussed below:

1. *Spatial Understanding and Reasoning* - Students will demonstrate an ability to see meaning in the arrangement of natural, social, or cultural phenomena in space, by creating new geographic information through measurement and observation as well as manipulating and querying spatial data, and modeling spatial relations.
2. *Research Practice* - Students will demonstrate an understanding of relevant geospatial techniques and methods of research by developing strong hypothesis-driven research proposals suitable for funding by external institutions and agencies.
3. *Communication Skills* - Students will demonstrate clear and effective communication skills by engaging in formal and/or informal teaching in the Department and other settings. They will also present research results at departmental colloquia as well as at national and international disciplinary conferences, and in peer-reviewed scientific journals.
4. *Independent Research* - Students will demonstrate preparation for a career of independent research by developing original research proposals, seeking out external funding support for and carrying out research projects. They will develop presentation of their research outcomes through international disciplinary conferences, and in peer-reviewed scientific journals.

These proficiency goals will form the basis for the assessment process for our proposed Ph.D. program. Beyond these goals, the program will also emphasize the socialization of doctoral students into the ethics, *mores*, and expectations of the academic and professional communities.

C. Need for the Program

1. State need. Briefly describe why the program is specifically needed for the State of Alabama. (State need is considered a priority in the review process.)

Alabama is one of only eight states in the Nation and three in the southeastern United States that do not offer doctoral education in geography at their flagship university. Many of the existing doctoral programs can be considered retrogressive considering the level of advanced training they provide to their Ph.D. students. These two parallel facts underpin the need to implement a Ph.D. program in geography at the University of Alabama. At present, students graduating from universities in Alabama who wish to pursue doctoral training must leave the state to obtain their degrees.

According to our records, at least 15 students who received Master's degrees in Geography from Auburn University, University of Alabama, and University of North Alabama in the past five years have left the state to seek doctoral education elsewhere (the Auburn University and University of North Alabama data are included in their letters of support for this proposal – see Appendix A). Current geography faculty members at the University of Alabama routinely (2-3 inquiries/year/research active faculty member) receive numerous inquiries from students wishing to seek a Ph.D. from our program, not realizing that we are not able to meet that demand.

As noted in Table 2 it is very likely that there is currently a need for at least five Ph.D. Geography positions in academia alone in Alabama each year. With continued growth of higher education institutions this number is likely to increase, as is the demand for geography Ph.D.s not affiliated with higher education. In addition to the actual need for Ph.D.s, the development of a Geography Ph.D. program will lead to an increase in the number of Ph.D.s who come to our program from out of state (including international students) and some of those students will end up staying in Alabama and contributing to the growth of the Alabama economy by building the “intellectual infrastructure to generate new knowledge and discoveries” (State Science and Technology Institute, 2006).

In 2010, an Academic Program Review was conducted for the University of Alabama Department of Geography, and the Committee's report stated “...that the next few years may be an opportune time to invest in a doctoral program” but that such an endeavor required increased research productivity from the department. Since that time, much of the Department's strategic vision and, especially faculty recruiting has been guided by that motivation. Principally as the result of five new faculty appointments, we have had good success at increasing publication rates and winning external research funding – trends that we aim to continue (Table 1).

Table 1: Summary of external funding (\$) and RJA (refereed journal article), per faculty member publication rates for the last six fiscal years (FY).

FY	2010	2011	2012	2013	2014	2015
FUNDING AMOUNT	\$15,000	\$93,456	\$69,063	\$210,946	\$393,294	\$216,364
RJA	<1.00	<1.00	1.45	1.45	2.17	2.23

Based on our recent increase in faculty and scholarly productivity, the Department now has an exceptional capacity (particularly with regard to faculty research foci such as water) to provide scholarly training at the Ph.D. level especially in critical areas falling under the umbrella of human-environment interaction. This disciplinary focus is not currently possible at many other regional institutions, and yet it is rapidly emerging as a research priority driven by institutional and academic recognition of the dynamic connections that exists between human and natural systems.

Compared to other institutions, we are designing both a curriculum and a learning community intended to prepare our Ph.D. students, both intellectually and professionally, for success in the highly competitive marketplace of the 21st century. Our curriculum will stress in-depth mastery of theory and concepts needed to understand the interactions of human-environment systems, while also emphasizing biogeophysical science perspectives related to that theme. Coupled with the thematic training, will be advanced training in geospatial analysis, whereby all of our graduating students will be required to take a minimum of three techniques courses.

In designing our proposed program, we intend to create “Stewards of the Discipline” as defined and described in the essay by Walker et al. 2009 — *The Formation of Scholars: Rethinking Doctoral Education For The Twenty-First Century* (John Wiley & Sons) — developed as part of the *Carnegie Foundation Initiative on the Doctorate*. That document (and the Carnegie Initiative) stresses the importance of combining the curricular elements of a doctoral program with mentoring that aids in the socialization and professionalization of the students. In doing so we will satisfy a need within the State of Alabama and meet a national demand for improved doctoral training for the next generation of geographers.

Our need justification is primarily based on data from the Southern Regional Education Board (SREB) and the Alabama Commission on Higher Education (ACHE) as well as our discipline’s national organization, the Association of American Geographers (AAG), regarding both academic departments and job demand in non-academic fields as expressed in various AAG data and by the Bureau of Labor Statistics (BLS). We also relied upon data developed by the Carnegie Initiative on the Doctorate and the Center for Innovation and Research in Graduate Education.

2. Employment Opportunities. Based on your research on the employment market for graduates of this program, please complete the following table reporting the total projected job openings (including both growth and replacement demands) in your local area, the state, the SREB region, and the nation. These job openings should represent positions that require graduation from a program such as the one proposed.

Table 2. Career and College Readiness/Preparation -- Projected Job Openings

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Local	1	1	1	1	1	5
State	4	5	4	5	4	22
SREB	78	80	82	83	85	408
Nation	729	741	753	765	777	3,765

Please briefly describe your methodology for determining employment opportunities – projected job openings. Be sure to cite any data sources used in formulating these projections. The actual survey instrument, detailed results, and associated data file(s) must be maintained internally by the institution for five years from the implementation date. The survey upon which the proposal is based must be available for ACHE Staff examination upon request for that five year timeframe. The survey instrument, detailed results, or associated data file(s) should not be included in the proposal.)

Projecting Local Job Openings: Our projections for local job openings are based on experience over the last five years with faculty positions at the University of Alabama. During that period we hired seven new faculty members, slightly more than one per year. Some of these appointments represent a faculty expansion. On the other hand, we have had four faculty members leave our department through retirement or resignation, slightly less than one per year. Our estimate of one opening per year locally is based on those statistics. This estimate concerns only academic openings at the University of Alabama – there may be others associated with other local higher education institutions, e.g., Stillman College and Shelton State Community College, and local government agencies, e.g., the NOAA-National Water Center, the U.S. Geological Survey, the State Oil and Gas Board, or the Alabama Geological Survey, and private corporations, e.g., Alabama Power/Southern Company— all entities that currently employ our previous graduates or with whom our students are working through faculty collaborations or internships.

Projecting Statewide Job Openings: Our projections for state-wide job openings are based on a simple analysis of the number of academic geographers with Ph.D. degrees who are currently employed in geography or geography-related programs in the State of Alabama. First, we established an estimate of a national faculty turnover rate. In a recent article in *Science*, Kaminski and Geisler (2012) reported that the retention rate for Associate and Full Professors is 90-92% (echoing the findings of Nagowski, 2006), and lower (about 85%) for Assistant Professors. For simplicity, we assume that the overall academic turnover rate is typically in the range of 8-10%, and that this number is applicable to institutions of higher learning in Alabama.

We have identified eight universities in Alabama with noteworthy numbers of faculty members with doctoral degrees in geography: Alabama State University (6); Auburn

University (8, includes AU Montgomery); Jacksonville State University (5); Samford University (3); Troy University (6); University of Alabama (14); University of North Alabama (7); and University of South Alabama (5). The total, as of December 2015, is 54. Applying the national turnover rate of 8-10%, as described above, then an annual demand for our state is about four to five Ph.D. Geography positions in academia alone, and we have used these numbers in the table above. These are conservative estimates, as they do not include non-academic positions in government agencies or the private sector that commonly employ Geography Ph.D.s For example, a student that completed a Ph.D. at UA in Interdisciplinary Studies with a Geography faculty member as his primary adviser (because there is not a Geography Ph.D. program) is currently employed as a researcher for Southern Company.

Projected Job Openings in the States Associated with the Southern Regional Education Board: Our projections here are made based upon the current number of Ph.D. geographers employed in Geography (or closely related) departments and programs in the SREB states. A survey of web sites indicates that as of March, 2016 there were 787 faculty members holding Ph.D.s in geography employed in the 16 SREB states. We use this as our base number and assume an 8% decadal growth in demand for post-secondary geography educators (projected by the Bureau of Labor Statistics, U.S. Department of Labor) will occur during the five year period represented in the Table (i.e., 1.6% per year) and replacement rates (of 10%) as projected by Kaminski and Geisler (2012). These numbers consider only academic openings in SREB and are, therefore conservative values.

Projected Job Openings at the National Level: According to the Bureau of Labor Statistics, U.S. Department of Labor there are currently (2014) approximately 5,400 people employed as postsecondary geography teachers. According to Babbitt et al. (2008) about 75% of geography Ph.D.s work in the academic sector. This suggests an approximate employment of 7,182 geography Ph.D.s across the nation. Applying the same formulas as we used to determine annual job openings in the SREB region we calculate that a little over 700 jobs are available to geography Ph.D.s annually. Note however that the BLS data do not identify whether postsecondary geography teachers do in fact have Ph.D.s and therefore these estimates may be somewhat high.

In addition to the BLS data we also obtained statements from the Association of American Geographers and the American Geographical Society that address the potential of our proposed Ph.D. program to help meet the demand for the next generation of scholars needed by academia and the government sector at the national level (see Appendix B).

3. *Student Demand - Enrollment projection.* Please briefly describe your methodology for determining enrollment projections. If a survey of student interest was conducted, *please briefly describe the survey instrument, number and percentage of respondents, and summary of results.*

(The survey instrument, and associated data file(s) need not be included in the proposal. This proposal information should be maintained for ACHE Staff review for five years from the actual implementation date.)

We calculated the number of UA Geography MS students (past ten years) who enrolled in Ph.D. programs at other institutions to determine how many UA students would potentially pursue Geography Ph.D. studies at UA if a program were in place. We also requested data from other Alabama Geography programs to determine how many students from those programs pursued Geography Ph.D.s outside Alabama (see Section C1; and Appendix A).

We estimated student demand by comparing UA with enrollment at relevant competing Ph.D. programs throughout the nation, with special emphasis on SREB schools. We also estimated potential student demand by examining enrollment in Geography Departments at SREB region schools (Table 3; Figure 1).

We report the number of Ph.D.s produced in the United States over the last 10 years using data available in the Association of American Geographers (AAG) annual Guide to Programs as a means of showing the increased interest in doctoral education through time (Figure 2).

Table 3. Data from AAG Guide to Programs and/or departmental web sites.

University	Ph.D.. Students	Faculty Size	Ph.D./Faculty Member
Ok St.*	22	14	1.6
FIU*	55	25	2.2
TX St*	57	27	2.1
UNCG*	17	13	1.3
LSU	53	25	2.1
FL	36	17	2.1
TN	35	18	1.9
KT	33	22	1.5
GA	56	23	2.4
SC	28	21	1.3
TAMU	31	24	1.3
average	38	21	1.8
Future UA**	22	17	1.3

*Program less than about 20 years old, **10 year target enrollment.

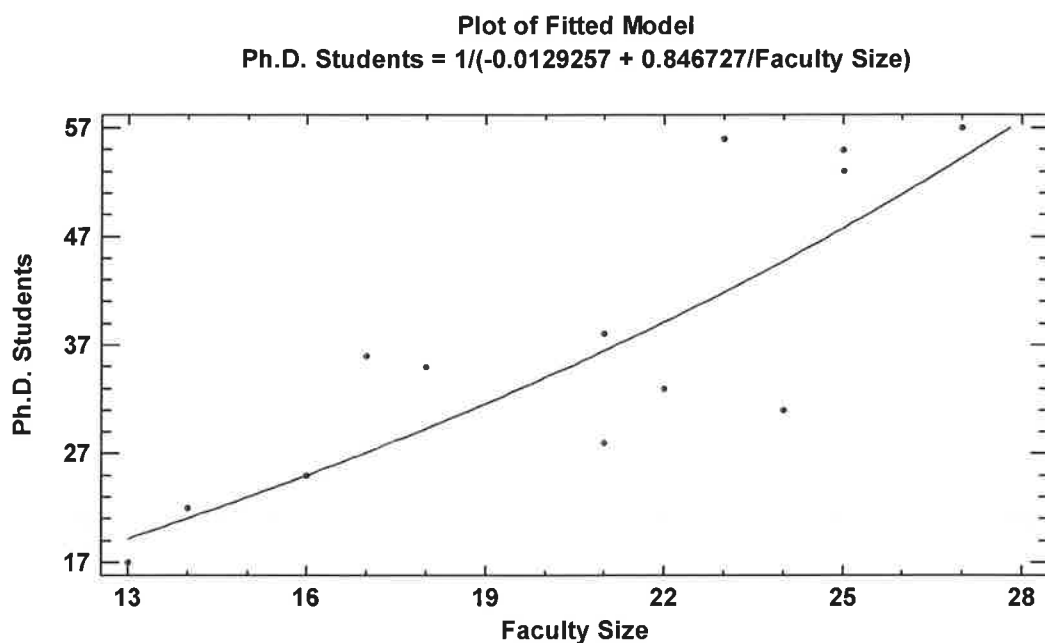


Figure 1. Relationship between faculty size and number of Ph.D. students enrolled for the programs listed in Table 3 ($R^2 = 76.2\%$; $P = 0.0005$). According to this model, we should enroll about 22 Ph.D. students.

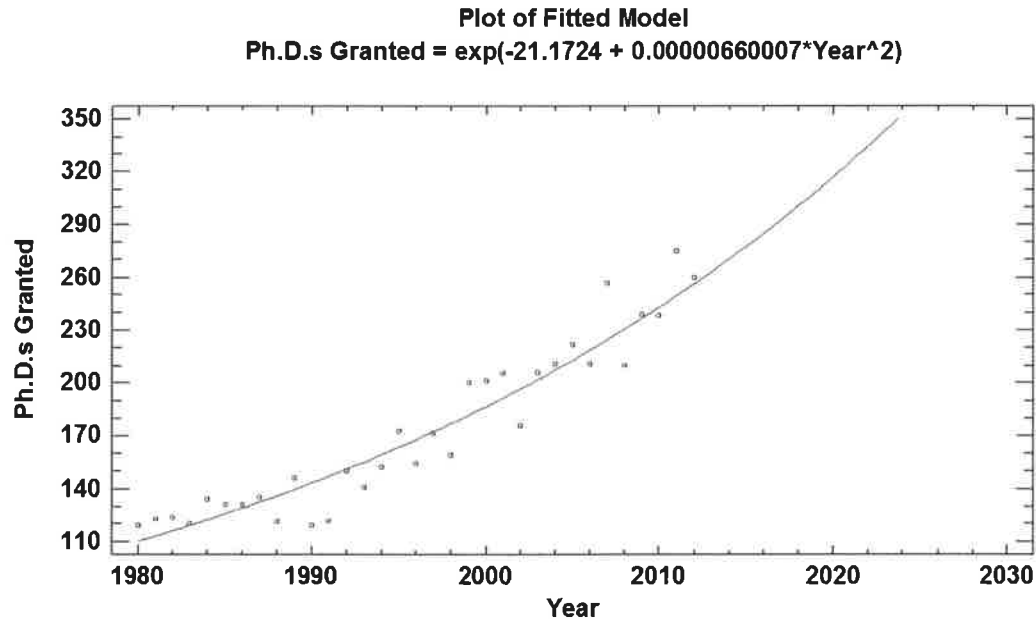


Figure 2. Potential demand according to Ph.D. graduation rate model projected through 2025. Data from AAG Guide to Programs (2015).

D. Specific Rationale (Strengths) for Program

What is the specific rationale (strengths) for recommending approval of this proposal? List no fewer than three (3) and no more than five (5) potential program strengths.

1. There is a growing demand for Geographers in general and although training in geography at the Ph.D. level is available at several other flagship Universities in the region, currently no Ph.D. training in Geography is offered at any institution in Alabama.
2. In addition to traditional Geography there is a growing need for training that focuses on research into opportunities and risks associated with complex coupled human-environment interaction and resources such as energy and water.
3. The University of Alabama Geography Department has an exceptional capacity (particularly in regards to number of faculty with relevant research foci) to provide scholarly training in critical areas of coupled human-environment interaction (such as water science and resources) not currently possible at other regional institutions.
4. In addition to the strong pool of faculty in the UA Geography Department with a focus on water resources and geospatial techniques, the new NOAA-National Water Center represents a unique opportunity for not only research collaboration for our faculty but also Ph.D. training, given the access to world class facilities and researchers.
5. The addition of a Geography Ph.D. will be a strong signal that the University of Alabama is committed to joining the ranks of R1 universities in the region such as the Universities of Georgia, Florida, and Tennessee, which all have Geography Ph.D. programs that often compete with our program for faculty and frequently admit Alabama's best students into their programs. The UA Geography Department faculty can be competitive with these and other highly ranked programs in terms of research productivity, but are seriously handicapped both in scholarly output and competitiveness for external funding by our inability to offer Ph.D. level training to the nation's best students.

Please note that letters of support may be included with the proposal.

Please see Appendices A and B.

E. Similar Programs

Using the ACHE Academic Program inventory found at <http://www.ache.state.al.us/Content/Departments/Instruction/StudentInfo.aspx>
List below all programs at the same degree level (by institution) that utilize the same 6-digit CIP code as the one being requested in the program proposal.

Also, list any programs at other CIP codes that may be offering similar instruction.

If there are no similar programs place a "0/none" by 1. in the listing directly below.

Note: Institutions should consult with ACHE Staff during the NISP phase of proposal development to determine what existing programs are considered duplicative of the proposed program.

The following institutions offer similar programs at this level:

1. 0/none

Please add numeration and list additional similar programs, if applicable.

If the program duplicates, closely resembles, or is similar to another program already offered in the State, provide justification for that duplication.
Also, if a graduate program, please identify and list any similar programs at institutions in other SREB states.

There are no Geography (or similar) Ph.D. programs offered by any institution in Alabama. Alabama is one of only three of the 16 SREB states that does not offer a Ph.D. in Geography (also e.g., Arkansas, Virginia). Eighteen Universities in the SREB region offer a Ph.D. in Geography and six others are not Geography Ph.D. programs but do offer geography concentrations or some similar curricula for the Ph.D. (Table 4). However the academic foci of most of the listed programs are substantially different from the program envisioned by the UA Geography Department. The table below shows the strength of each department in our core focus (human-environment interaction) as well as one of our proposed emphasis areas (water science and resources) as measured by number of faculty members with those research/teaching foci.

Table 4. Summary of SREB region Universities with Ph.D. Geography Programs

	<u>Universities</u>	<u>Ph.D. Program Focus</u>	<u>Faculty</u>		
			<u>Total in Dept.</u>	<u>Human-environment interaction</u>	<u>Water science and resources</u>
	UA	Human- environment interaction	16^{#*}	12[*]	9[*]
1	U. Delaware	Climatology	15	7	6
2	‡Florida State U.	Human/physical	12	3	3
3	U. Florida	Human/physical	17	9	4
4	U. Georgia	Human/physical	23	8	5
5	U. Kentucky	Human	22	3	0
6	‡Louisiana State U.	Anthropology and Geography	28	6	4
7	U. Maryland College Park	Coupled human natural systems	13	4	0
8	U. Southern Mississippi	Geology/Geography	11	3	2
9	UNC-Greensboro	Urban/Earth Science/GIS			
10	U. North Carolina Chapel Hill	Human/physical	25	9	4
11	U. Oklahoma	Human/physical/GIS	14	7	2
12	Oklahoma State U.	Human	14	4	0
13	U. South Carolina	Human/physical	21	9	6
14	‡U. Tennessee	Human/physical	18	6	2
15	Texas A&M U	Human/physical	24	9	5
16	Texas State U.	Education/GIS	27	10	6
17	U. Texas Austin	Human/physical	16	7	3
18	West Virginia U.	Geology, Geography and Environmental Geoscience	15	5	2
1	Florida International U.	Global and Sociocultural Studies			
2	U. of South Florida	Geography and Environmental Science & Policy			
3	Johns Hopkins	Geography and Environmental Engineering			
4	U. of Maryland Baltimore County	Geography and Environmental Systems			
5	UNCC	Geography and Earth Sciences			
6	Virginia Tech U.	Geospatial and Environmental Analysis			

Includes full and part-time graduate faculty

* Includes faculty starting in Fall 2016

‡ Academic Common Market Institutions for Alabama residents

F. Collaboration With Other Institutions/Agencies

Does the institution plan on collaborating with other institutions in the delivery of this program?

☒ Yes

No ☐

If yes, please indicate below which institutions and describe the basis of this collaboration.

We believe that we have opportunities to develop collaborative relationships with members of the faculty of the department of Atmospheric Science at the University of Alabama in Huntsville. That department offers doctoral training in atmospheric science and, of perhaps greater relevance to our proposed Ph.D. program, B.S. and M.S. programs in Earth System Science. As one consequence of discussion between our programs we have proposed (see attached memo, Appendix C) that initial collaborations could involve UAH faculty members serving as Co-Chairs on dissertation committees for former UAH (and possibly other) students, when appropriate. We have also suggested our interest in developing articulation agreements whereby some of the UAH techniques courses in remote sensing and GIS could satisfy some of our core course requirements. We have left the door open to develop additional means of collaboration.

If no, please indicate your reasons why.

G. Curriculum

1. Program Completion Requirements: (Enter a credit hour value for all applicable components, write N/A if not applicable)

Credit hours required in major courses	<u>21</u>
Credit hours required in minor	<u>NA</u>
Credit hours in institutional general education or core curriculum	<u>NA</u>
Credit hours required in support courses	<u>3</u>
Credit hours in required or free electives	<u>24</u>
Credit hours for thesis or dissertation	<u>24</u>
Total credit hours required for completion	<u>72</u>

Course Work: An individualized plan of study is to be designed in consultation with the student's major advisor/doctoral committee. In addition to dissertation credits, a minimum total of 48 semester hours of course credit beyond the baccalaureate degree is required for the Ph.D., of which a minimum of 18 must be earned in continuous residence as a full-time student beyond the M.S. Twenty four (24) hours may be transferred from a completed Master's program. Four required Geography (GY) courses focused on quantitative and geospatial methods: 1) GY 600 *Research Traditions and Methods in Geography* (must be passed in the first semester of graduate residence), GY 520 *Remote Sensing*, GY 530 *Intro to Geographic Information Systems*, and GY 623 *Quantitative Methods*, for a total of fourteen required (14) major hours. Doctoral students must take at least 9 hours of courses above the 600 level with the remaining hours at 500 level or higher.

2. Will this program be related to other programs at your institution?

If so, which ones and how?

This program will not be related to or duplicate any existing programs at the University of Alabama. Our closest peer department is Geological Sciences, and we currently have one undergraduate course cross-listed with that department. We do not anticipate cross-listing any graduate courses with Geological Sciences.

3. Please identify any existing program, option, concentration or track that this program will replace at your institution.

None

4. Is it likely that this program will reduce enrollments in other graduate programs at your institution? If so, please explain.

It seems unlikely. Our program is quite different in orientation from those offered by our closest academic peer departments (e.g., Geological Sciences).

5. If this is a graduate program, please list any existing undergraduate programs at the institution, which are directly or indirectly related to the proposed graduate

program. If this is a doctoral proposal, also list related master's programs at your institution.

The Department of Geography at UA has a thriving undergraduate BS and BA and a healthy M.S. program. We strive to establish the first Ph.D. program in Geography in the State of Alabama.

6. Please complete the table below indicating the proposed program's courses. Include the course number, and number of credits. (If feasible/useful, please group courses by sub-headings within the table.)

Table 5. UA Geography current and planned courses.

Course Number	Course Title	Credit Hours
GY 600	Research Traditions and Methods in Geography	3 [#]
GY 502	Climatology	3
GY 504	Physical Geography of the Southeastern USA	3
GY 505	Directed Research in Physical Geography	3
GY 506	Directed Research in Human Geography	3
GY 507	Boundary Layer Climates	3
GY 509	Forest Restoration	3
GY 512	Hydroclimatology	3
GY 513	Applied Climatology	3
GY 515	Endangered Species	3
GY 517	Extreme Weather and Society	3
GY 520	Remote Sensing	4
GY 623	Quantitative Methods	3 [#]
GY 530	Intro to Geographic Information Systems	4
GY 535	Remote Sensing II	4
GY 536	Advanced GIS	4
GY 538	Application Issues in GIS	4

GY 539	GIS Programming	4
GY 540	Community Facilities Planning	3
GY 541	Land Use Regulations	3
GY 544	Field Studies in Africa	6
GY 552	Environmental Decision Making	3
GY 553	Environment and Society	3
GY 554	Field Studies in Costa Rica	4
GY 558	Urban Planning and Analysis	3
GY 560	Environmental Management	3
GY 561	Social Impact Assessment	3
GY 563	Ecosystem Services	3
GY 565	Regional Planning and Analysis	3
GY 566	Regional and Urban Transportation Systems	3
GY 567	Global Environmental Change	3
GY 572	Soil Science	3
GY 586	Drainage Basin Dynamics	3
GY 589	Forest Ecology and Vegetation Analysis	3
GY 591	Fluvial Geomorphology	3
GY 594	Forest Measurement and Analysis	3
GY 595	Coastal Geomorphology	3
GY 599	Colloquium	1*
GY 610	Seminar in Biogeography	1-4*
GY 609	Seminar in Climatology	1-4*
GY 612	Seminar in Planning	1-4*
GY 617	Seminar in Human-Environment Interaction	1-4*
GY 630	Seminar in Geospatial Analysis	1-4*

GY 663	Seminar in Geomorphology	1-4*
GY 685	Seminar in Water Science and Resources	1-4*
GY 699	Dissertation Research	Var.

#course level change, *new course

7. Enumerate and briefly describe any additional requirements such as preliminary qualifying examination, comprehensive examination, thesis, dissertation, practicum or internship, some of which may carry credit hours included in the list above.

Requirements for Admission: Requirements for admission to the program will be similar to those for the M.S., e.g., a completed application, including a Statement of Purpose, minimum combined GRE score of 300, and minimum GPA of 3.0 on completed coursework. Conditional admission may be considered if a student satisfies one of the two scoring criteria and has notable experience or outstanding recommendations. Normally students will identify a major advisor at the time of application. However in all cases students are required to name a major advisor within six weeks of entering the program. No students will be admitted without support from a potential advisor.

A completed M.S. degree in Geography, (or equivalent), will be required for formal admission to the Ph.D. program. Any students accepted for graduate study with a B.A. or B.S. degree will be placed in the M.S. program. Admission to the Ph.D. program from the Geography M.S. program is made only with the written recommendation of the Department Chair to the Dean of the Graduate School, and is contingent upon excellent performance at the M.S. level and a strong expectation of success at the doctoral level, as determined by the Graduate Studies Committee.

Plan of Study: Ph.D. Students are required to submit a Plan of Study within six weeks of entering the Ph.D. program. Course requirements are determined by each student's major advisor/doctoral committee but must include; 1) GY 600 Research Traditions and Methods in Geography (must be passed in the first semester of graduate program, unless waived in which case students must substitute a 500 or 600 level course in Geography or similar field) 2) proficiency in quantitative methods must be demonstrated by having passed at least six hours of relevant quantitative methods courses (see "Course Work" above) and passing GY 623 Seminar in Quantitative Methods. Enrollment in GY 599 (Colloquium) is required of resident graduate students whenever offered. A maximum of 3 hours of GY 599 may be applied toward the Ph.D. In addition students will complete at least 9 hours of 600 level courses in Geography with emphasis on sub-field specialty.

Doctoral Committee: Within six weeks of entering the Ph.D. program, the student will have named a major advisor. It is expected that the relationship with the advisor will be one of apprenticeship, as the student moves toward a mastery of the craft of original research and publication, while gaining familiarity with the role of a colleague. The doctoral committee should be established by the end of the first semester in residence. It will consist of no fewer than five faculty members, all of whom must be members of the

Graduate Faculty. Geography faculty must form the majority of the committee and at least one member of the committee must be an external member. Prior to the end of the second semester in the program the student must submit the form for Appointment/Change of a Doctoral Dissertation Committee.

Candidacy Examinations: By the end of the fifth semester in residence (not including summer) students must pass candidacy examinations for admission to doctoral candidacy. The purpose of the examinations is to determine students' preparation for independent research. The examinations will include a written exam that will consist of a series of questions from general areas of geography as well as those directly related to individual students' subfield and specific research program. Questions for the examination are submitted by a candidacy committee, which will consist of the geography faculty members of the student's doctoral committee. The student must also successfully pass an oral examination given by the candidacy committee on the student's program of study and related areas. A student may take the oral and written examinations twice. Failing either of the examinations twice results in dismissal from the program. The examinations should be completed at least nine months before the degree is to be awarded.

Dissertation Proposal Oral Defense: By the end of the fifth semester in residence (not including summer) students must successfully defend their written dissertation proposal in the format of a presentation to the doctoral committee. Any interested faculty and students from the University community may attend. After satisfactorily defending the proposal the student will provide the doctoral committee with a revised written proposal for approval. Following approval by the student's doctoral committee the topic of the dissertation must be approved by the Dean of the Graduate School.

Admission to Candidacy: Successful completion of required coursework as outlined in the Plan of Study, passing the written and oral candidacy examinations and successful defense of the dissertation proposal results in a recommendation to the Dean of the Graduate School for admission to candidacy for the degree.

Dissertation Research and Writing: A minimum of 24 semester hours of dissertation research credit is required, earned in accordance with the guidelines of the Graduate School.

Dissertation Oral Defense: Upon completion of the dissertation research, which includes the submission of a draft dissertation to the doctoral committee students must successfully defend their work in the format of an oral presentation to the doctoral committee. An oral defense will be scheduled two weeks in advance and notice will be suitably posted. The student's committee will attend, as well as any interested faculty and students from the University community.

8. Does the program include any options/concentration. If so, please describe the purpose and rationale and list the courses in the option.

No, the core focus for the Geography Ph.D. is human-environment interaction, but this does not represent a concentration as such.

H. Program Review and Assessment

In the final analysis, the institution and its governing board are accountable for the quality, utility and productivity of this and all other programs of instruction.

With this in mind, please describe the procedures that will be used in assessing the program's outcomes.

Be sure to include:

1. An assessment process for the student learning outcomes;

The University's goal is to provide scholarly training at the Ph.D. level in critical areas of coupled human-environment systems interaction. This disciplinary focus is not currently possible at many other regional institutions, and our interdisciplinary faculty research expertise enables us to fill a niche for which there is a growing demand. To achieve this goal requires rigorous assessment of student learning outcomes based on national standards. Therefore our students graduating with a Ph.D. in Geography should be able to meet the following **Program Goals**:

1. Program Goal (Spatial Reasoning) - Students will develop an ability to see meaning in the arrangement of natural, social, or cultural phenomena in space.

Related learning outcomes:

1. Demonstrate scholarly proficiency in geography, as well as distinctive scholarly achievement in coupled human-environment systems and geospatial analysis.
2. Demonstrate specialized knowledge of geography at a level sufficient to conduct independent research.

2. Program Goal (Research Practice) - Students will become geographical problem-solvers capable of using qualitative, quantitative, and/or spatial methods of research appropriate to existing holders of a Ph.D. in the field of Geography and of publishable quality in peer-reviewed research journals.

Related learning outcomes:

1. Understand the range of methodologies and tools used in their geography sub-field. This can include measurement, analysis, and modeling methods.
Demonstrate scholarly proficiency in geography, as well as distinctive scholarly achievement in one or more of the following fields: physical systems, water sciences, and geospatial techniques
2. Review, synthesize and critically evaluate research in their subfield of geography.
3. Understand how research tools and results in their subfield of geography fit into a broader context of geography and science.
4. Students will design and implement an original research project using innovative and novel methods

3. Program Goal (Communication Skills) - Students will become clear and effective communicators

Related learning outcomes:

1. Communicate effectively to large and small groups in pedagogical settings in both lecture and discussion formats, using a variety of instructional formats.
2. Understand and follow research and professional ethics, according to standards set forth by the Association of American Geographers (AAG) or other relevant professional and academic organizations in geography and related disciplines.
3. Structure a coherent and convincing academic argument.
4. Review and synthesize relevant literature.
5. Write at a level and in a style consistent with scholarly publications in geography and related fields.
6. Understand and properly use styles of citing, referencing, and formatting found in scholarly publications in geography and related fields.
7. Make clear and cogent oral presentations.

4. Program Goal (Independent Research)

1. Develop independent, original research projects that are of high theoretical and methodological quality.
2. Submit at least one external grant proposal relevant to their research (normally this would be an NSF-DDRI proposal) and at least one other proposal for research funding as Co-PI or PI from a professional society or other granting body
3. Deliver three or more presentations related to their research at national or international professional meetings
4. Produce three or more high-quality peer-reviewed scholarly publications in geography and related fields as a result of their Ph.D. research.

5. Program Goal (Professional Development) - Students will be highly prepared for professional careers in Geography or allied fields as faculty or research scientists in colleges and universities or as research staff and/or upper-level management in government, non-profit entities, and/or the private sector

Related learning outcomes:

1. Prepare talks or posters suitable for presentation at a research conference.
2. Prepare manuscripts that meet the standards of scholarly publications in geography and related fields.
3. Select appropriate conference venues to present their research.
4. Select appropriate fellowship or grant opportunities and prepare competitive proposals.
5. Supervise and/or mentor research assistants effectively.
6. Demonstrate effort at professional networking including the development of an online portfolio of research networking.

As noted in Section G7, assessment of these outcomes will include oral and written candidacy exams, a written and oral defense of the dissertation proposal, a committee review of the dissertation and an oral defense of the dissertation. The student's committee will also require submission of a proposal for external funding of the proposed research as well as multiple presentations of the student's research at professional meetings and preparation of at least three manuscripts for publication in peer-reviewed journals.

3. A follow-up plan to determine accomplishments of graduates such as obtaining relevant employment or being admitted to a masters or doctoral program (graduate or professional).

We will annually collect information regarding our graduates' relevant employment and career advancement. This will primarily be accomplished by surveying department faculty, given that individual faculty will likely have the most current information regarding their former students. This information will be maintained by the departmental office in collaboration with the Geography Graduate Program Director.

I. Accreditation

If there is a recognized (USDE or CHEA) or other specialized accreditation agency for this program, please identify the agency and explain why you do or not plan to seek accreditation. If there is no accrediting or similar body for this degree program state as such in your response.

No

J. Instructional Delivery Method

1. Describe which instructional delivery methods will be utilized in delivering this program.

Most instructional delivery for Ph.D. level course work will take the form of seminars focused on discussion oriented towards faculty and student's specific research areas, as well as specific instruction in methods and techniques relevant to the dissertation research being carried out by students. It is also expected that many Ph.D. students will work closely with their advisors on research being carried out by faculty. For example, many if not most of our students should eventually be supported by external research funding awarded to faculty or students.

2. If distance technology is being utilized, indicate an approximate percent of the total program's courses offered that will be provided by distance education ___0___ %

3. If distance education is not being utilized, please explain why not.

Ph.D. level instruction is generally not amenable to online delivery, particularly given the small number of students likely to be in any one Ph.D. level course. Obviously a great deal of communication (teaching/mentoring) goes on between faculty and students at the Ph.D. level, but we do not foresee a need to develop specific online courses at this time.

K. Resource Requirements

1. *Faculty.* Do not attach the curriculum vitae of each existing or additional faculty members to this proposal. (The institution must maintain and have current and additional primary and support faculty curriculum vitae available upon ACHE request for as long as the program is active.) *Please do provide a brief summary of Faculty and their qualifications specific to the program proposal.*

The UA Geography Department currently has 11 full-time tenure/tenure track faculty and has recently finalized the hiring of three additional full-time T/TT faculty. We also have two part-time tenured graduate faculty bringing our total to 16 graduate faculty by fall 2016. Our near-term goal is to increase the size of the faculty to approximately 17 full-time members. However these hires are not necessary for the successful development of the Ph.D. program.

In addition to increasing our T/TT faculty strength, we are in the process of hiring a director for our new (Spring 2016) Geospatial Lab that has dramatically enhances our facilities and supports our recent designation as a *Center of Academic Excellence* by the National Geospatial Intelligence Agency and the US Geological Survey. This new hire and other current staff affiliated with the Lab will provide excellent support for the Ph.D. program.

As noted in Section B., our faculty have a strong overall focus on human-environment interaction as well as specialties in water science and resources and geospatial analysis (among others). UA Geography faculty also have strong collaborative relationships with researchers in other Colleges and Departments such as Biological Sciences, Geological Sciences, New College, and the UA Law School, as well as interdisciplinary research groups on campus such as the Center for Freshwater Studies, the Environmental Institute, the USGS, and the Water Policy and Law Institute (Figure 3).

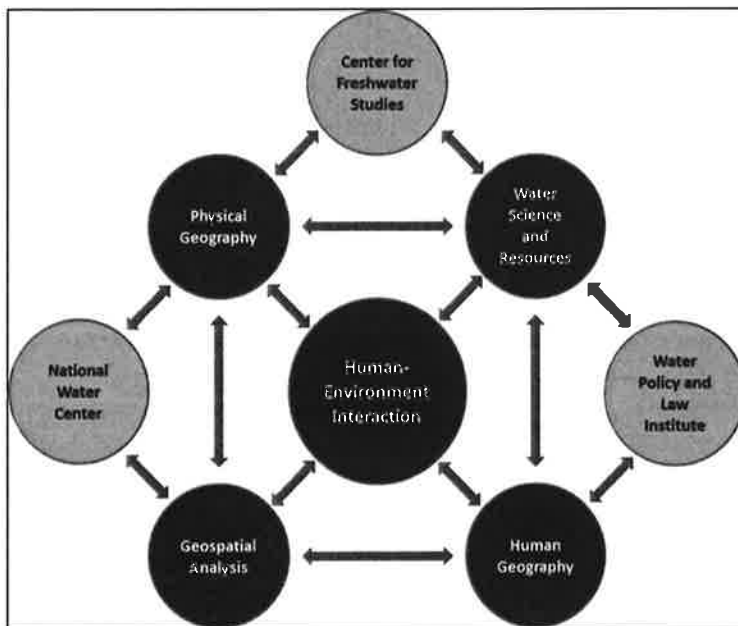


Figure 3. The core teaching and research focus of the proposed Geography Ph.D. Program at the University of Alabama will be the study of human-environment interaction. **The core unites the different departmental faculty interests and amplifies a common vision.** The diagram also illustrates how different faculty specialties interact with one another internally, and depicts examples of how the program elements articulate with other campus programs.

The Geography Department has 12 graduate (counting recent hires; Table 4) faculty with strong research and teaching interests in our Department's core area of human-environment interaction including: Angelica Almeyda-Zambrano*, Seth Appiah-Opoku, Eben Broadbent, Lisa Davis, Justin Hart, David Keellings*, Matthew LeFevor*, Sarah Praskievicz, Jason Senkbeil, Michael Steinberg, Matthew Therrell, and Joe Weber.

Within that core, nine faculty have specialized interests in Physical Geography (Broadbent, Cohen, Davis, Hart, Keellings, Praskievicz, Senkbeil, Sherman, and Therrell). Five are focused on Human Geography (Almeyda-Zambrano, Appiah-Opoku, LeFevor, Richetto, and Steinberg). Five have strong capabilities in Geospatial Analysis (Almeyda-Zambrano, Broadbent, Cohen, Han, Weber). And nine (Cohen, Davis, Keellings, LeFevor, Praskievicz, Senkbeil, Sherman, Steinberg, Therrell) have very strong research records in water science and resources. In addition, Bennett Bearden a Research professor in our Department is nationally recognized for work in water Law and Policy.

Additional areas of common research interests for faculty include forest ecology (Almeyda-Zambrano, Broadbent, Hart, and Therrell), climatology (Keellings, Senkbeil, Therrell) and Latin America (Almeyda-Zambrano, Broadbent, LeFevor, Steinberg, and Therrell).

Current Geography Department Faculty

Angelica M. Almeyda Zambrano, Ph.D., Assistant Professor (Fall 2016). Earned her Ph.D. from Stanford University. Her research interests include: human-environment interactions and their impacts on ecosystems, including on plant and animal composition, abundance and interaction, and ecosystem services.

Seth Appiah-Opoku, Ph.D., AICP, Associate Professor. Earned his Ph.D. from the University of Waterloo, Ontario. His research interests include: Urban Design Studio; Regional Planning & Analysis; Land Use Regulation; Principles of Planning; Environmental Management; Field Studies in Africa; Regional Geography of Africa; World Regional Geography; Introduction to Environmental Science; Ecological Economics; Gender & Development.

Eben N. Broadbent Ph.D., Assistant Professor. Earned his Ph.D. from Stanford University. His research interests include: Canopy biology, Climate change, Conservation biology, Defaunation, Ecosystem ecology, Ecophysiology, Forest fragmentation and connectivity, Hyperspectral imaging, Land use and land cover change, Landscape modeling, LiDAR, Remote sensing, Tropical ecology, Tropical forestry.

Sagy Cohen, Ph.D. Assistant Professor. Earned his Ph.D. from the University of Newcastle. His research interests include: Geomorphology, Hydrology, Soil Science, Numerical Modeling, GIS, Remote Sensing. Soil-landscape evolution modeling, Rivers Fluxes, Global Sediment Dynamics, Landform Evolution modeling, Remote Sensing, Hydrology.

Lisa Davis, Ph.D., Associate Professor. Earned her Ph.D. from the University of Tennessee. Her research interests include: Fluvial geomorphology, watershed science, geo-social and geo-ecological interactions.

Luoheng Han, Ph.D., Professor and Associate Dean, College of Arts and Sciences. Earned his Ph.D. from the University of Nebraska. His research interests include: Remote sensing of water quality, modeling nutrients dynamics using GIS, hyperspectral remote sensing, quality management of inland and coastal waters.

Justin L. Hart, Ph.D. Associate Professor. Earned his Ph.D. from the University of Tennessee. His research interests include: Forest Development, Forest Disturbance Ecology, Ecological Plant Geography, and Natural Resources Management.

David J. Keellings, Ph.D., Assistant Professor (Fall 2016). Earned his Ph.D. from the University of Florida. His research interests include: climatology, extreme events, and applied statistics, modeling extreme temperatures, atmospheric drivers of extremes, and the impacts of climate change on extremes and health.

Matthew C. LeFevor, Ph.D., Assistant Professor (Fall 2016). Earned his Ph.D. from the University of Texas. His research interests include: human-environment relationships, water resources and management, conservation agriculture, environmental history, and, Mexico, the Caribbean, and the larger Atlantic world.

Sarah Praskievicz, Ph.D., Assistant Professor. Earned her Ph.D. from the University of Oregon. Her research interests include: Climate-change impacts, water resources, hydrologic modeling, fluvial geomorphology.

Jeffery P. Richetto, Ph.D., Associate Professor. Earned his Ph.D. from the Ohio State University. His research interests include: Land Use Planning, Regional Economic Development, Industrial Development/Site Analysis, Urban Growth, International Trade/Foreign Direct Investment, Human Imprints on the Earth's Landscape.

Jason C. Senkbeil, Ph.D., Associate Professor. Earned his Ph.D. from Kent State University. His research interests include: Atmospheric Hazards, Severe Weather Hazard Perception, Severe Weather Warnings, Hurricane Hazards, Severe Weather Mitigation, Air Quality and Health, Applied Climatology, Classification Schemes and Applications, Climate Variability/Change, Precipitation/Drought Anomalies.

Douglas Sherman, Ph.D., Professor, Chair. Earned his Ph.D. from the University of Toronto. His research interests include: Coastal and aeolian geomorphology, sediment transport, natural hazards.

Michael K. Steinberg, Ph.D., Associate Professor. Earned his Ph.D. from Louisiana State University. His research interests include: Jaguar-Human Conflicts in southern Belize, Participatory mapping to delineate and protect sport fishing grounds in Belize, Redfish conservation history in US, Environmental change analysis based on the journals of J.J. Audubon, Hemingway landscapes in Cuba.

Matthew D. Therrell, Ph.D., Associate Professor. Earned his Ph.D. from the University of Arkansas. His research interests include: Dendrochronology, Paleoclimatology, Water resources, Environmental Sustainability, Biogeography, Mexico, Southern Africa.

Joe Weber, Ph.D., Professor. Earned his Ph.D. from the Ohio State University. His research interests include: Transport geography, accessibility and time geography, transportation networks, and roadside landscapes, National Parks, American West and Arid lands.

a) Please provide faculty counts for the proposed program:

Table 6.

Status	Faculty Type	
	Primary	Support
Current- Full Time	14*	2
Current-Part Time	2	2
Additional-Full Time (to be hired)	Two to three	N/A
Additional-Part Time (to be hired)	N/A	N/A

* Including three faculty who will start in Fall 2016

b) Briefly describe the qualifications of new faculty to be hired.

While we have recently requested three additional faculty positions (searches in Fall 2016) these new positions are not required for the successful development of the Ph.D. program. They are however intended to add specific programmatic strengths in themes where relatively small investments in new faculty members are expected to yield disproportionately large improvements in our teaching and research, and in both the University of Alabama's and our department's critical efforts to forge a nationally-recognized research identity.

The two requests include 1) two expansion positions as a mini-cluster to strengthen our expertise in issues associated with understanding different aspects of the water-energy-food nexus, and that could also be part of a broader, joint initiative between the College of Arts and Sciences and the College of Engineering, 2) one position that will strengthen our capabilities in geospatial analysis (including remote sensing).

These three positions will allow us to directly align strengths in human geography to complement those in physical geography and to enhance our strengths in geospatial analysis. In addition to the contributions that these new appointments will make toward the establishment of a high-quality Ph.D. program, we also expect concomitant growth in the number of undergraduate Geography and Environmental Sciences majors. The human geography oriented tracks in our undergraduate program are ripe for expansion and the realignment of our faculty expertise and interests should spark such growth. In particular, much of this growth is anticipated to stem from an increased and improved geospatial science and technology curriculum, where, according to the US Bureau of Labor

Statistics and the National Geospatial Information Agency, career opportunities are expanding faster than the supply of qualified professionals.

The substantial degree of water-oriented research expertise and course offerings in this department, enhanced by these anticipated appointments, also afford immediate and tangible opportunities for research and teaching articulation with the National Water Center, the UA Center for Freshwater Studies, and the UA Water Policy and Law Institute.

In addition, according to the *2014, RAC PRIME Report*, the research productivity of the University of Alabama, especially with regard to external funding, sorely lags that of our sister public universities. This department has already demonstrated a transformed research agenda through increased publication rates and amount of external funding. With these additional positions we expect to continue the transformation and increase total productivity—helping both the College of Arts and Sciences and the University improve their research profiles in doing so. Note: these positions are not listed in Section K given that if they are approved they will begin prior to the start of the Ph.D. program and if not approved they will not materially affect the development of the program.

2. Equipment. Will any special equipment be needed specifically for this program?

☐ Yes ☒ No

If "Yes", please list:

The cost of the new equipment should be included in the table following (Section K.).

3. Facilities. Will any new facilities be required specifically for the program?

☐ Yes ☒ No

If "Yes", please list. Only new facilities need be listed. Their cost should be included in the table following (Section K.).

4. Library. Are there sufficient library resources to support the program?

☒ Yes ☐ No

Please provide a brief description of the current status of the library collections supporting the proposed program.

The Geography faculty feel that our current library collections are more than sufficient for a research-oriented department of our size and scope. At our request, the UA Libraries Associate Dean for Research and Instruction undertook an examination of our holdings and found them to be comparable to other relevant UA departments. Please see Appendix D.

If "No", please briefly describe how any deficiencies will be remedied; include the cost in the table following (Section K.).

5. Assistantships/Fellowships. Will you offer any assistantships specifically for this program?

☒ Yes ☐ No

If "Yes", how many assistantships will be offered? Be sure to include the amount in the table following.

We anticipate offering an average of 10 Ph.D. assistantships over the course of the first five years of the program.

Number of assistantships offered

Be sure to include the cost of assistantships in the table following (Section K.).

6. Program Budget. The proposal projected that a total of \$ in estimated new funds will be required to support the proposed program.

A projected total of \$ will be available to support the new program.

L. New Academic Degree Program Proposal Summary Form

- In the following "NEW ACADEMIC DEGREE PROGRAM PROPOSAL SUMMARY" table, please provide a realistic estimate of the costs of the program.
- This should only include the additional costs that will be incurred, not current costs.
- Indicate the sources and amounts of funds available for the program's support.
- DO NOT LEAVE ANY PORTION/SOURCES OF THE NEW FUNDS OR FUNDS AVAILABLE BLANK. ENTER "\$0" IF THERE ARE NO NEW FUNDS NEEDED OR NO FUNDS AVAILABLE.

- THERE MUST BE AN ACTUAL DOLLAR AMOUNT PROVIDED FOR TUITION, SINCE THOSE FIGURES REPRESENT PROJECTED ENROLLED STUDENTS.
- **If it is stated that new funds are requested or if it is a reallocation of resources, please explain directly below from what source(s) the funds for the proposed new program, (e.g. faculty, equipment, etc.) will be attained.**

No new funds are needed or requested for the development of our proposed Ph.D. program. In the past four years we have added four new faculty lines to the department bringing our total graduate faculty to 16 (beginning Fall 2016). While we have recently requested three new positions, as noted above these are not required for the program.

Regarding Ph.D. assistantships, we are currently budgeted for 15 permanently funded Graduate Assistant (GA) lines per year. We also routinely support graduate research assistants through external funding secured by faculty as well as Graduate Council Fellowships and other lines of support. These lines currently support MS students. As Ph.D. students are admitted to the program the GA lines supporting MS students will be converted to Ph.D. positions and therefore do not represent new costs for the program. In addition to the 15 currently budgeted GA positions, we anticipate being able to provide external funding (through grants) for at least an additional five (5) Ph.D. students by the fifth year of our program.

If tuition is used to support the program, what start-up revenue source will be used to initiate the program.

Tuition will not be used to directly support the program. We estimate, that about 40% of the Ph.D. GAs will be from out of State. Therefore on average eight out twenty are calculated at the out of-state tuition rate of \$25,950. The remaining 12 (60%) are calculated at the in-state rate of \$10,170 per academic year.

➤

Also, include enrollment and completer projections.

- New enrollment headcounts are defined as unduplicated counts across years. For example, if "Student A" would be initially enrolled in the program in year 2, and again is enrolled in the program in years 4 and 5; "Student A" is only counted in the new enrollment headcount in year 2.
- Total enrollment headcounts represent the actual number of students enrolled (both part-time and full time each year. This is a duplicated count).

NEW ACADEMIC DEGREE PROGRAM PROPOSAL SUMMARY

INSTITUTION University of Alabama
 PROGRAM Geography Ph.D.

ESTIMATED NEW FUNDS REQUIRED TO SUPPORT PROPOSED PROGRAM

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
FACULTY	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
LIBRARY	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
FACILITIES	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
EQUIPMENT	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
STAFF	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
ASSISTANTSHIPS	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
OTHER	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u>0</u>
TOTAL	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u>0</u>

SOURCES OF FUNDS AVAILABLE FOR PROGRAM SUPPORT

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
INTERNAL REALLOCATIONS	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
EXTRAMURAL	<u></u>	<u>31,000</u>	<u>46,500</u>	<u>62,000</u>	<u>62,000</u>	<u>201,500</u>
TUITION	<u>46,290</u>	<u>46,290</u>	<u>56,460</u>	<u>82,410</u>	<u>82,410</u>	<u>313,860</u>
TOTAL	<u>46,290</u>	<u>77,290</u>	<u>102,960</u>	<u>144,410</u>	<u>142,410</u>	<u>515,360</u>

ENROLLMENT PROJECTIONS AND DEGREE COMPLETION PROJECTIONS

Note: "New Enrollment Headcount" is defined as unduplicated counts across years.

	Year 1	Year 2	Year 3	Year 4	Year 5	<u>5-YEAR AVERAGE</u>
FULL TIME HEADCOUNT	<u>4</u>	<u>6</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>7.4</u>
PART TIME HEADCOUNT	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>0.6</u>
TOTAL HEADCOUNT	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>	<u>12</u>	<u>8.0</u>
NEW ENROLLMENT HEADCOUNT	<u>4</u>	<u>4</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>4.8</u>
DEGREE COMPLETION PROJECTIONS	<u>0</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>3.0</u>

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Appendix A. Letters of Support from Alabama Geography Programs



COLLEGE OF SCIENCES AND MATHEMATICS DEPARTMENT OF GEOSCIENCES

29 February 2016

Doug J. Sherman, Ph.D.
Chair, Department of Geography
College of Arts and Sciences
University of Alabama
Tuscaloosa, AL 35487

Dear Dr. Sherman,

I am especially pleased to learn that your program is moving forward with a proposal to offer a Ph.D. degree in Geography. As the first program in the State of Alabama to offer the Ph.D. degree, you will be making a monumental contribution to enhance education and economic development opportunities both within the state and beyond its borders.

Clearly there is a need for this degree option in Alabama, and many of our students at Auburn University would benefit from that opportunity. The Geography program at Auburn University graduates approximately 5-10 undergraduate majors (B.A. Geography) and 2-3 graduate students (M.S. Geography) per year. As you may be aware, we recently completed the probationary phase of our M.S. Geography program by graduating 15 students within the 5-year probation period designated by the state (ACHE). Six of those 15 M.S. students have been accepted into Ph.D. programs, and possibly one or two more may have been accepted that I am not aware of at present. I have no doubt that most of these students would have strongly considered your program had it been available at the time.

In closing, I strongly support this application to establish a Ph.D. degree in Geography at the University of Alabama, Tuscaloosa. I look forward to working with you in any way that I can to help you and your program achieve success in this effort.

Sincerely,

Philip L. Chaney, Ph.D., P.S.
Department of Geosciences
Auburn University

210 PETRIE HALL
AUBURN, AL 36849-5305

GEOLOGY
TELEPHONE: 334-844-4282
FAX: 334-844-4486

GEOGRAPHY
TELEPHONE: 334-844-4074
FAX: 334-844-3409

www.auburn.edu

February 25, 2016

Dr. Douglas J. Sherman

Professor and Chair

Department of Geography

University of Alabama

Bx 8/0322

Tuscaloosa, Alabama 35487 0322



Dear Doug,

RE: UNIVERSITY OF ALABAMA DEPARTMENT OF GEOGRAPHY NISP FOR A PhD PROGRAM

Thank you for your kind letter that I received this week in the mail regarding your intent to submit a proposal to offer a PhD in Geography at the University of Alabama Department of Geography. I have consulted with my faculty and we are all unanimously in support of your intent. The official response from our university which has Geography input is in the mail. Anyhow, it is an open secret there is a need for Geography PhD program in our State. I strongly believe the demand is there - and who else has the resources and capacity to offer a PhD program in Geography in the State - if not the Department of Geography at the University of Alabama. It pains me that in the 5 years of the existence of a MS graduate program at the University of North Alabama, we are yet to send a graduate to a Geography PhD program. We have so far sent three graduates from our MS program to out-of-State non-Geography PhD programs - two to University of Memphis (Earth Science), and one to Middle Tennessee State University (Geography Education). A PhD program in our State would have been a great option for those students. Let me know if I can be of further help. If there is any way we can collaborate, do not hesitate to let us know.

Sincerely

Francis Kottl - Professor and Chair

DEPARTMENT of GEOGRAPHY
UNA Bx 5064, Florence, AL 35631-0001
P: 256.765.4246 | F: 256.765.4141 | www.una.edu
Equal Opportunity / Equal Access Institution

Appendix B. Letters of Support from Academic Societies



Department of Geography

April 7, 2016

Subject: Proposal to create a Ph. D. program in geography at the University of Alabama

Dear Dr. Sherman:

I enthusiastically support your proposal to elevate your department and university by adding a new Ph. D. program in geography. The proposal itself offers convincing proof of the need one in your state and especially in your state's flagship university. I will address the broader need in society.

First and foremost, Ph. D. programs of academic disciplines should attend to the intellectual needs of students and faculty and public. Still, there is a pressing need to meet workforce needs for the good of the state's economy and for the prospects of graduates.

Public Interest in geography

In 2012, the American Geographical Society surveyed adult U. S. residents nationwide on their understanding of the discipline and appreciation for geography and geographic education. We found an overwhelmingly strong pro-geography constituency. Asked to compare geography to reading, writing, and mathematics, two-thirds of a key cohort said geography was just as important. That's an astounding affirmation, considering the high regard most people have for "the 3 Rs." Geography fared even better when compared to representative physical sciences and social sciences.

The AGS Geographic Knowledge and Values Survey findings suggest that an American pro-geography constituency would support increased funding for geography education and stricter standards that would require students to take more geography courses taught by instructors educated in geography. These results suggest a substantial mandate for increasing the standing of the U. S. in geographic literacy so that American citizens will be well-trained for the global workforce and can successfully engage in an increasingly inter-connected society.

The implications for colleges and universities are clear, as well, because primary and secondary education cannot be improved without concomitant improvements in higher

education. States will need to establish rigorous standards for geography teachers, and schools of education will need to respond with an adequate supply of teachers steeped in geography. Any attempt to improve geographic competence in the U. S. labor force will require even more dramatic improvements in undergraduate and graduate programs.

We concluded that, to meet educational and vocational goals, scholarships should be available to support the best and brightest students who choose to pursue undergraduate and graduate degrees in geographic education and research. Grants should be available to encourage substantially increased geographic research, including fieldwork, both foreign and domestic, by faculty and students. Development grants should be available to upgrade or create geography faculties throughout the nation; ensure topical, regional, methodological, and technological coverage; upgrade geographic technology; and promote community outreach. It is encouraging to learn that the University of Alabama is pursuing such advances on its own volition.

Popular Geographics

We presently are witnessing a societal movement of massive proportions. There is enormous public enthusiasm for popular geographics—the nebulous collection of geographic technologies, such as Google Earth and spatially enabled social networking, that can be understood and employed at little or no cost without much formal training. This amounts to a democratization of geography and promises to inspire increased support for geography at all levels K through Ph. D.

Workforce Needs and Jobs for Geographers

In 2014, the fastest growing job title in Utah and Kansas was “geographer.”

If ever there was any question that geography is among the foremost of professions, the last shred of doubt has been dispelled by reports on employment trends over the past decade. The U. S. Department of Labor, *The Guardian* newspaper, MSN.com, *Money Magazine*, and PayScale.com stated our case better than geographers themselves normally do.

MSN.com in its Money section on May 5, 2014 covered “America’s most and least common jobs.” Geography was among the least common, and I’ll talk about that aspect later, but there was good news too, “Still, some of these uncommon jobs do have growth potential and

include relatively high salaries.” The data cited by MSN.com came from the U. S. Bureau of Labor Statistics (BLS). “The average geographer earned more than \$75,000 annually as of 2013.” What’s more, “The BLS forecasts that these jobs will grow by 29 percent . . . between 2012 and 2022.”

On April 22, 2012, Debra Auerbach of CareerBuilder.com wrote about “10 jobs with above average salaries.” Then at \$74,170, geographers were second highest, and all jobs on the list were projected to grow more than 29 percent over the subsequent decade. Auerbach explained, “Geographers study the earth and its land, features and inhabitants. They also examine political and cultural structures as they relate to geography. This is a good occupation for lovers of travel, as geographers often travel to conduct fieldwork.” In 2010, *The Guardian* published a poll showing that geography graduates had the very lowest unemployment rate of all disciplines in the United Kingdom (<http://careers.theguardian.com/careers-blog/experts-view-why-are-certain-grads-less-likely-to-be-unemployed>). Among the previous year’s graduates, 7.4 % of geographers were unemployed in January 2010, compared to 16.3 % of information technology (IT) graduates.

“What makes . . . geography grads the most employable?” Alison White asked, and the answer came from Nick Keeley, director of the Careers Service at Newcastle University, “Studying geography arms graduates with a mix of skills employers want to see: Geography students generally do well in terms of their relatively low unemployment rates. You could attribute this to the fact that the degree helps develop a whole range of employability skills including numeracy, teamwork through regular field trips, analytical skills in the lab and a certain technical savviness through using various specialist computing applications. Also, the subject area in itself cultivates a world view and a certain cultural sensitivity. These all potentially help a geographer to stand out in the labour market.” For many years the U.S. Department of Labor has recognized geospatial technology as one of the three top growth industries today, alongside nanotechnology and biotechnology. “Over 500,000 professionals in fields ranging from environmental engineer to retail trade analysis are asked to use GIS in their jobs. The Bureau of Labor Statistics show that surveyors, cartographers, and photogrammetrists (a subset of GIS occupations) are experiencing faster than average employment growth - anticipating growth at 19 percent between 2008 and 2018.” (http://www.doleta.gov/brg/indprof/geospatial_profile.cfm).

Money Magazine and PayScale.com placed “geographic information system analyst” in its

list of the "Top 100 Best Jobs in America" in 2010. The 2011 list of the "Best Jobs in Fast-Growth Fields" included various careers that utilize GIS.

Certainly the majority of these jobs will be filled by graduates at the Bachelor's level, but demands for Masters and Doctorates are high compared to most other disciplines. Plus, the prestige and practical aspects of having a Doctoral program with active research projects will enhance the attractiveness of all graduates to employers.

The state of the world in regard to geography

Your proposal offers an accurate and effective evaluation of where Alabama stands within the United States. An even more compelling case can be made that the United States needs Alabama (and other states) to step forward in geography. Consider, for instance, that Oxford and Cambridge Universities have prominent Ph. D. granting geography departments, yet Harvard has none. Moscow State University has 15 geography departments, yet no viable geography departments remain in the top 20 private universities in the U. S. Prince William has a Master's Degree in geography, and Vladimir Putin is the Chairman of the Board of Trustees of the Russian Geographical Society, yet no president since Lyndon Johnson graduated from a university that currently has a geography department. Numerous studies show that American students today have extremely low levels of geographic knowledge, even when geographic literacy is defined merely as knowing place names and locations.

With only 67 Ph. D. granting universities in the U. S., the lack of knowledge, analytical capability, and intellectual capacity has caused incalculable damage to the nation and the world in science and society. The result is painfully predictable for anyone who values education. In foreign policy, American interests at home and abroad have been severely damaged by geographic ignorance. We the People made uninformed choices about going to war (Vietnam, Iraq). We sent troops into battle unprepared for what they faced culturally (Iraq, Afghanistan) and physically (hostage rescue attempt in Iran). We misjudged the national will of adversaries (China crossing the Yalu River in 1950, the worst land warfare defeat in U. S. history). We failed to account for deep-seated hatreds among cultures (Sunni vs. Shia in Iraq). We underestimated the commitments and capabilities of adversaries (Vietnam, Beirut,

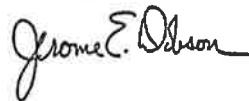
Mogadishu, Afghanistan). We alienated allies (Europe regarding Iraq). We ignored clear warnings by prominent geographers (Isaiah Bowman on Vietnam, Harm de Blij on Saddam Hussein's intention to invade Kuwait). Occasionally, warfighters embarrassed our country, hurt national interests, or died because they did not understand foreign cultures, customs, and sensitivities (Iraq, Afghanistan). Occasionally, analysts misused or failed to use geographic technologies with tragic results (bombing the Chinese Embassy in Belgrade). Most recently we failed to understand North African societies sufficiently to anticipate the Arab Spring.

Conspicuously missing in every case has been the kind of understanding that geographers spend their careers developing and teaching, even in introductory classes. In each case, some wise people in government—geographers and others—warned decision makers, but there was practically *no public debate* over alternative actions and consequences until after the damage was done. In each case, there was *no public constituency* to support those in government who did understand. An informed public is essential to democracy, but, when it comes to foreign policy, the U. S. doesn't have one. That applies to voters, journalists, analysts, policy makers, and politicians.

In his popular, non-fiction book *The Fourth Part of the World*, science writer Toby Lester (an editor of *The Atlantic* and not a geographer himself) credits geography with informing, inspiring, and motivating the Renaissance. Kudos to Alabama for keeping that beacon burning!

I am honored that you invited me to review and comment on this vital step forward for the University of Alabama and the nation.

Sincerely,

A handwritten signature in dark ink, reading "Jerome E. Dobson". The signature is fluid and cursive, with the first name "Jerome" and last name "Dobson" clearly legible.

Jerome E. Dobson, Professor Emeritus of Geography, University of Kansas and President, American Geographical Society



April 6, 2016

Professor Douglas Sherman
Chair, Department of Geography
University of Alabama
Tuscaloosa, Alabama 35487-0322

Dear Professor Sherman,

In my capacity as a Past President of the American Association of Geographers and as chair of that organization's Healthy Department's Committee, I am writing to express my strong endorsement of your proposal for a new PhD program in geography at the University of Alabama. In my view this would be a particularly auspicious time to launch a new doctoral program in geography in Alabama given the growing recognition of the discipline's pedagogic and social importance, the rapidly expanding cadre of students interested in geographic matters, and the strength of Alabama's geography program.

Expanding the cadre of individuals with advanced understanding of geography is critical to meeting some of the most pressing pedagogic and research challenges of our time. As you well know, the discipline of geography is sometimes poorly understood in the United States—a reflection, in part, of a period during which geography was marginalized in the U.S. educational system. However, attention to geography is rising rapidly in recent years in the wake of growing awareness of the critical need to advance understanding of the interconnections between humans and the environment and between peoples and places around the world. At a time when the United States is struggling to develop better ways to confront environmental change, advance economically, and engage effectively with other parts of the globe, advanced geographical training has never been more needed.

Fortunately, geography in the U.S. is undergoing a renaissance of sorts. Over the past two decades students have flocked to geography degree programs in record numbers, existing geography departments have expanded, and new geography programs have sprung up. The Department of Geography at the University of Alabama is well positioned to benefit from, and contribute to, these developments. Your department is already known as for its research and teaching on matters pertaining to the interconnectivity of human and physical systems and for the ways in which geospatial technologies can be used to advance understanding of our changing planet. Were you to launch a PhD program you would be able to hit the ground running, and capitalize on the growing awareness of the contributions geography can make to education, scholarly research, and policy making.

The strategic nature of your initiative is underscored by the findings of a 2010 study of the National Academy of Sciences—National Research Council that I chaired. Entitled *Understanding the Changing Planet: Strategic Directions for the Geographical Sciences*, the study looks at the many ways the geographical sciences are contributing to efforts to address major societal needs—ways that are very much in keeping with the research and teaching going on at the University of Alabama. The study also draws attention to the critical importance of developing a more geographically literate society and research community if we are to address many of the pressing challenges of our time.

At least three key points bear emphasis when considering the value of building a doctoral program in geography at your institution:

- There is a pressing need for educators who can help the next generation of students develop a stronger grasp of the world around them. Students desperately need a more sophisticated understanding of the cultural, economic, and environmental patterns and processes that lie at the heart of the geography curriculum. As the interrelatedness of issues and problems becomes increasingly apparent, the value of geography's integrative approach has never been clearer. That helps to explain the phenomenal success of the relatively new Advanced Placement program in human geography in the nation's high schools (3000 students in 2001; close to 200,000 in 2015-2016). This success translates into a growing number of high school students entering colleges and universities looking to major in geography—with self-evident positive ripple effects for graduate programs in geography.
- The past two decades have seen an explosion in the development and use of geographic technologies. Geographic information systems (GIS) have become key tools for land use decision-making, environmental protection, marketing analysis, disaster management, epidemiological analysis, and much more. Moreover, geographic technologies provide a core platform for interdisciplinary research and collaboration within the university and beyond. Since the products of GIS are no better than the quality of the geographic conceptualizations that go into the construction of each data layer, a growing number of individual with advanced training at the intersection of geography and GIScience is exactly what is needed to address the need for more and better-trained researchers with expertise in the geographical sciences.
- As a direct follow-on from the former points, employment opportunities for geographers have been growing. Individuals with advanced geographic training are finding their skills in demand in planning agencies, policy institutes, educational institutions, development agencies, and many other venues. The graduates of a new doctoral program in geography at the University of Alabama would be in a strong position to find employment and contribute to society's efforts to address a range of social and environmental challenges.

In short, a strong doctoral program in geography would be an asset to your institution, the State of Alabama, and the discipline of geography. If your proposal for a new doctoral program is successful, I am convinced the program will pay dividends at a time when more and more students are gravitating toward geography, and when geographic expertise is in high demand. The American Association of Geographers is excited by the prospect of a new PhD program in geography at the University of Alabama, and we stand ready to be of help to you in any way we can.

Sincerely,

A handwritten signature in dark ink, appearing to read "Alex B. Murphy", with a long horizontal stroke extending to the right.

Alexander B. Murphy
Professor of Geography & Rippey Chair in Liberal Art and Sciences
University of Oregon

Chair, Healthy Departments Committee, Association of American Geographers
Past President, Association of American Geographers

Appendix C. Letter from University of Alabama Department of Geography detailing our initial proposal for collaboration.



April 11, 2016

Professor Lawrence Carey, Chair
Department of Atmospheric Science
University of Alabama in Huntsville
Huntsville, Alabama


Dear Professor Carey:

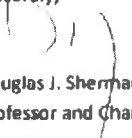
Thank you for entertaining our conversations concerning potential collaborations between your faculty and ours, in particular vis-à-vis our (proposed) Ph.D. program. There are probably many ways that we can foster collaboration, but our faculty has suggested two avenues as first steps.

First, we believe that there may be graduates of your undergraduate or graduate programs in Earth System Science who might be interested and suited to enroll in our Ph.D. program, especially given our faculty strengths in physical geography. To that end, we envision our program as one mechanism for those students to continue their education in a similar field, but with the potential to maintain advisory relationships with their UAH mentors. This could be accomplished by facilitating Co-Chair relationships between the latter and members of our faculty. Interested faculty members from your department will be nominated for appointment to our graduate faculty, thus making them eligible to Co-Chair dissertation committees.

Second, we would propose an articulation agreement whereby a set of relevant graduate level courses taken at UAH would satisfy core course requirements in our Ph.D. program. This would involve the automatic substitution of remote sensing and GIS courses (for example) for our required courses. This proposal would need to be approved by our graduate school, but I believe that such a proposal would be successful.

Beyond these beginnings, we would be pleased to consider other collaborative options that you might suggest. I look forward to continuing this conversation as our proposal moves forward. And please consider this also to be a formal invitation for you to visit our department at your convenience.

Sincerely,


Douglas J. Sherman
Professor and Chair

Appendix D. Letter from University of Alabama Libraries

University Libraries

February 2, 2016



Geography Program Ph.D. Committee
University of Alabama
Department of Geography
Box 870322, 204 Farrah Hall
Tuscaloosa, AL 35487-0322

To the Geography Program Ph.D. Committee:

This letter outlines the support University Libraries has provided for the geography program for the years 2010-2015 as well as examples of current resources available.

Over a five year period, the University Libraries has invested \$475,315 directly for resources to support geography. This includes

\$2,489.00 for print books

\$69,027.95 for electronic books

\$85,490 for database subscriptions

\$318,307 for journal subscriptions.

In addition, resources in Engineering and Interdisciplinary budgets support the programs.

Electronic resources that support Geography include:

- GeoRef
- GeoScience World
- Web of Science
- Knovel
- NTIS
- USGS Publication Warehouse
- Compendex
- Inspec

We have electronic journal and e-book subscriptions from Springer, Wiley and Elsevier. Our Elsevier subscriptions include Science Direct and Scopus.

The Rodgers Science and Engineering Library houses the physical collection related to geography; however, electronic resources may be accessed from any computer on campus and off campus via a valid University login.

Box 870266
Tuscaloosa, Alabama 35487-0266
(205) 348-1561
www.lib.ua.edu

Page 2

Librarians in Rodgers support the collections, instruction and reference needs for faculty and students.

The University Libraries provide access to 142 software packages (<http://www.lib.ua.edu/#/software>) including programs such as ArcGIS. Assistance for using the programs is available in the library and via databases such as Safari Books Online.

Our InterLibrary Loan agreements include services that deliver journal articles to the desktop within 24 hours.

The holdings and support provided by the UA Libraries for the Geography program are comparable to holdings of other PhD-granting departments at UA and similar institutions.

If resources beyond our current holdings are needed now or in the future, University Libraries would need additional funds to support the PhD research curriculum.

Sincerely,



Mildred L. Jackson, Ph.D.
Associate Dean for Research & Instruction
University Libraries
Box 870266, Tuscaloosa, AL 35487

The University of Alabama System Outline for New Program Proposal (Supplement)

In addition to the items ACHE has requested for program proposals, please include the following additional items when developing and submitting academic program proposals to the System Office and the Board of Trustees for approval.

1. Executive Summary (not to exceed two pages)

The Department of Geography at the University of Alabama is committed to the discovery, application, and dissemination of knowledge concerning the Earth's natural and social systems with emphasis on natural hazards and human impacts on the environment. We help improve the quality of life for the people of our state, nation, and the world through research, teaching, and service to our discipline, and by inspiring students to contribute to society as informed citizens, policy makers, and scientists.

The PhD program in Geography at the University of Alabama will support the training and professional development of highly skilled, STEM-educated knowledge workers able to meet the growing academic, governmental, and private sector demand for scientists focused on coupled physical-human systems. Particular strengths of the program will include a strong emphasis on both an Earth-systems science approach and applying powerful geospatial analytical techniques and technologies to understanding the complex systems that not only sustain the natural and built environmental but also pose emerging risks to society.

Alabama is one of only eight states in the Nation and three in the Southeast that do not offer doctoral education in geography at their flagship university. The addition of a Geography PhD will not only support the University's strategy to advance research at UA, but will also be a strong signal that the University of Alabama is committed to joining the ranks of Carnegie R1 universities in the region such as the Universities of Florida, Georgia, and Tennessee, which all have Geography PhD programs that compete with our Department for faculty and that frequently admit Alabama's best students into their programs. The UA Geography Department faculty can compete with these and other highly ranked programs in terms of both research productivity and student development, but we are seriously handicapped both in scholarly output and competitiveness for external funding by our inability to offer PhD level training to the best students from Alabama and across the Nation.

There is a growing demand for Geographers in general (according to the US Department of Labor), including a growing need for training that focuses on research into opportunities and risks associated with complex coupled human/environmental systems and sustainability of resources. For example, the National Research Council recently found that "There is a particularly critical need to better understand the impact of natural and anthropogenic environmental changes..." and that "...these changes can be expected to have profound societal and economic consequences globally."

In 2010, an Academic Program Review was conducted for the University of Alabama Department of Geography, and the Committee's report stated "...that the next few years may be an opportune time to invest in a doctoral program". Based on our recent increase in faculty and scholarly productivity, the Department now has an exceptional capacity (particularly with regard to faculty research foci) to provide scholarly training at the PhD level especially in critical areas of human-environmental interaction. This disciplinary focus is not currently possible at many other regional institutions.

In addition to our strong pool of geography faculty with a focus on water resources and geospatial analysis and techniques, the establishment of the NOAA National Water Center on our campus presents a unique opportunity for research collaboration for our faculty and for PhD training given the access to world-class facilities and researchers. Beyond the Water Center, UA Geography faculty have strong collaborative relationships with researchers in other Colleges and Departments such as Biological Sciences, Geological Sciences, New College, and the UA Law School, as well as interdisciplinary research groups on campus such as the Center for Freshwater Studies, the Center for Academic Excellence in Geospatial Sciences, the Environmental Institute, the USGS, and the Water Policy and Law Institute.

The Department of Geography at UA has thriving undergraduate (BS/BA) and MS programs. We are committed to the establishment of the first PhD program in Geography in the State of Alabama. Compared to other institutions, we are designing both a curriculum and a learning community intended to equip our PhD students, both intellectually and professionally, for success in the highly competitive marketplace of the 21st century. Our PhD students will be highly prepared for professional careers in Geography or allied fields as faculty or research scientists in colleges and universities or as research staff and/or upper-level management in government, non-profit entities, and/or the private sector. Many of these students will generate the intellectual and cultural capital that will help drive future economic and social growth in Alabama.

2. Steps taken to determine if other UA System institutions might be interested in collaborating in the program.

We analyzed the faculty strengths and programmatic foci of the Geography and closely allied disciplines in other institutions within the University of Alabama System. From this analysis we concluded that the Atmospheric Science Department at the University of Alabama in Huntsville offered the greatest potential for collaboration. This is mainly a consequence of the quality of their BS and MS programs in Earth Systems Science – a discipline that complements the approach that we emphasize in our PhD program proposal. UAH is also the only institution that indicated any desire to collaborate in the responses to our Notice of Intent to Submit a Proposal

(NISP). The Chair of the Atmospheric Science Department, Dr. Lawrence Carey was contacted by email and telephone to discuss possibilities, and there was an agreement that we should pursue opportunities to collaborate. Potential first steps were outlined in a letter to that department, a copy of which follows this page.

3. Desegregation impact statement

School: Department of Geography, University of Alabama
Field of Study/ Program Title: Geography
Degree: Ph.D.
CIP Code: 45.0701

The Department of Geography is strongly committed to Chancellor Witt's statement that As an academic community, our educational mission is enhanced by the robust exchange of ideas that occurs within a diverse and inclusive learning environment, with a diverse student body, faculty...

We are therefore committed to improving the diversity and inclusivity of our students and faculty. This is especially important because, as is true for STEM fields generally and Geosciences in particular, relatively few individuals from underrepresented groups (including women) pursue Geography at any level especially the PhD. For example according to data collected by the Association of American Geographers only about 34% of Geographers with a PhD are female, and few ethnic minorities are earning PhDs in Geography (e.g., African American (3%), Asian (11%), Hispanic (3%), Native Alaskan (0.03%), Native American (0.53%), and Pacific Islander (0.18%).

Our faculty members are keenly aware of this situation and are making focused and sustained efforts to improve the inclusivity of our faculty. For example, our hiring process follows the "Active Recruiting Continuum" recommended by Human Resources at UA, which includes a number of proactive efforts to include quality candidates from underrepresented groups and efforts to maintain fairness in screening, selecting, and evaluating all applicants. Search Committee members also personally contact grad directors and other faculty at PhD granting Geography programs with large pools of minority graduates, to discuss the positions. Because of its strong focus on including candidates from underrepresented groups, the UA Geography hiring plan has been used as a successful model by several other departments in the College of Arts & Sciences since 2014.

Recruiting for our new PhD program will be vital to its success and making proactive efforts to recruit students from underrepresented groups will be an important focus of our program. As we do with faculty recruitment, we will also continue to contact Baccalaureate and Masters granting Geography programs (especially southeastern HBCUs) with large pools of minority

graduates to recruit PhD students. We will also continue to take part in the annual McNair Visitation Day sponsored by the Graduate School and the Graduate Recruiting Expo sponsored by the College of Arts and Sciences. And we will support graduate PhD student retention by encourage our students to take part in Graduate School sponsored programs such as Tide Together and Women in STEM Experience (WISE).

Most importantly, we will continue to make our faculty aware of the importance of the University of Alabama's commitment to diversity as part of our educational mission and how recruiting and retention efforts of individual faculty can help support the larger diversity goals of the University.

4. Summary of consultant's comments (if any)

None

5. Summary of other campuses' comments (if any)

We have sets of comments from other campuses in the State of Alabama of two types. The first set comprises the institutional remarks submitted in response to our The second set includes comments submitted in response to a request sent to the three departments in the State of Alabama that are authorized to award MS degrees in Geography: Auburn University, Jacksonville State University, and the University of North Alabama.

We received four sets of NISP responses. All agreed that the objectives of the proposal are clear and that the objectives are appropriate for the proposed program. Two of the responses had no comments or suggestions. One noted an interest in collaboration in the proposed program because of their strong MS program in Earth Systems Science. We recognize this institution as the University of Alabama in Huntsville because of that program, and have reached out to them (see Proposal Supplement – Part 2). The fourth response included comments about the nature of the program, noting that the stated objectives were very broad and that there were questions concerning the demand and potential success of the proposed program.

We received letters from Auburn University (Department of Geology and Geography) and the University of North Alabama in response to our request for their opinions concerning the demand/need for a Geography PhD program in the State of Alabama. Both institutions responded in support of our proposal, specifying the need for their best students to leave Alabama to seek doctoral training. Copies of those letters follow this statement.

6. Other pertinent information as needed (if any)

In support of our application for the new PhD program we solicited opinions from the two leading professional societies for our discipline: the American Association of Geographers (AAG); and the American Geographical Society (AGS). In particular, we asked the organizations to comment on the need for another PhD program in geography, especially configured as we propose. Both AAG and AGS responded in very positive language, supporting our application. Copies of those letters follow this statement

**University of Alabama System Outline for New Program Proposal (Supplement): Supporting Material
for Part 2:**



April 11, 2016

Professor Lawrence Carey, Chair
Department of Atmospheric Science
University of Alabama in Huntsville
Huntsville, Alabama

Dear Professor Carey:

Thank you for entertaining our conversations concerning potential collaborations between your faculty and ours, in particular vis-à-vis our (proposed) Ph.D. program. There are probably many ways that we can foster collaboration, but our faculty has suggested two avenues as first steps.

First, we believe that there may be graduates of your undergraduate or graduate programs in Earth System Science who might be interested and suited to enroll in our Ph.D. program, especially given our faculty strengths in physical geography. To that end, we envision our program as one mechanism for those students to continue their education in a similar field, but with the potential to maintain advisory relationships with their UAH mentors. This could be accomplished by facilitating Co-Chair relationships between the latter and members of our faculty. Interested faculty members from your department will be nominated for appointment to our graduate faculty, thus making them eligible to Co-Chair dissertation committees.

Second, we would propose an articulation agreement whereby a set of relevant graduate level courses taken at UAH would satisfy core course requirements in our Ph.D. program. This would involve the automatic substitution of remote sensing and GIS courses (for example) for our required courses. This proposal would need to be approved by our graduate school, but I believe that such a proposal would be successful.

Beyond these beginnings, we would be pleased to consider other collaborative options that you might suggest. I look forward to continuing this conversation as our proposal moves forward. And please consider this also to be a formal invitation for you to visit our department at your convenience.

Sincerely,

Douglas J. Sherman
Professor and Chair

**University of Alabama System Outline for New Program Proposal (Supplement): Supporting Material
for Part 5:**



COLLEGE OF SCIENCES AND MATHEMATICS
DEPARTMENT OF GEOSCIENCES

29 February 2016

Doug J. Sherman, Ph.D.
Chair, Department of Geography
College of Arts and Sciences
University of Alabama
Tuscaloosa, AL 35487

Dear Dr. Sherman,

I am especially pleased to learn that your program is moving forward with a proposal to offer a Ph.D. degree in Geography. As the first program in the State of Alabama to offer the Ph.D. degree, you will be making a monumental contribution to enhance education and economic development opportunities both within the state and beyond its borders.

Clearly there is a need for this degree option in Alabama, and many of our students at Auburn University would benefit from that opportunity. The Geography program at Auburn University graduates approximately 5-10 undergraduate majors (B.A. Geography) and 2-3 graduate students (M.S. Geography) per year. As you may be aware, we recently completed the probationary phase of our M.S. Geography program by graduating 15 students within the 5-year probation period designated by the state (ACHE). Six of those 15 M.S. students have been accepted into Ph.D. programs, and possibly one or two more may have been accepted that I am not aware of at present. I have no doubt that most of these students would have strongly considered your program had it been available at the time.

In closing, I strongly support this application to establish a Ph.D. degree in Geography at the University of Alabama, Tuscaloosa. I look forward to working with you in any way that I can to help you and your program achieve success in this effort.

Sincerely,

Philip L. Chaney, Ph.D., P.S.
Department of Geosciences
Auburn University

310 PETRIE HALL
AUBURN, AL 36849-5105

GEOLOGY
TELEPHONE: 334-844-4282
FAX: 334-844-4486

GEOGRAPHY
TELEPHONE: 334-844-4074
FAX: 334-844-3409

**University of Alabama System Outline for New Program Proposal (Supplement): Supporting Material
for Part 5:**

February 24, 2016

Dr. Douglas J. Sherman
Professor and Chair
Department of Geography
University of Alabama
Box 870322
Tuscaloosa, Alabama 35487-0322



Dear Doug,

RE: UNIVERSITY OF ALABAMA DEPARTMENT OF GEOGRAPHY NISP FOR A PhD PROGRAM

Thank you for your kind letter that I received this week in the mail regarding your intent to submit a proposal to offer a PhD in Geography at the University of Alabama Department of Geography. I have consulted with my faculty and we are all unanimously in support of your intent. The official response from our university which has Geography input is in the mail. Anyhow, it is an open secret there is a need for Geography PhD program in our State. I strongly believe the demand is there - and who else has the resources and capacity to offer a PhD program in Geography in the State - if not the Department of Geography at the University of Alabama. It pains me that in the 5 years of the existence of a MS graduate program at the University of North Alabama, we are yet to send a graduate to a Geography PhD program. We have so far sent three graduates from our MS program to out-of-State non-Geography PhD programs - two to University of Memphis (Earth Science), and one to Middle Tennessee State University (Geography Education). A PhD program in our State would have been a great option for those students. Let me know if I can be of further help. If there is any way we can collaborate, do not hesitate to let us know.

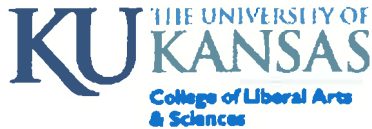
Sincerely,

Francis Kelli Professor and Chair

DEPARTMENT of GEOGRAPHY
UNA Box 5064, Florence, AL 35631-0001
P: 256.765.4246 | F: 256.765.4141 | www.una.edu

Equal Opportunity / Equal Access Institution

**University of Alabama System Outline for New Program Proposal (Supplement): Supporting Material
for Part 6:**



Department of Geography

April 7, 2016

Subject: Proposal to create a Ph. D. program in geography at the University of Alabama

Dear Dr. Sherman:

I enthusiastically support your proposal to elevate your department and university by adding a new Ph. D. program in geography. The proposal itself offers convincing proof of the need one in your state and especially in your state's flagship university. I will address the broader need in society.

First and foremost, Ph. D. programs of academic disciplines should attend to the intellectual needs of students and faculty and public. Still, there is a pressing need to meet workforce needs for the good of the state's economy and for the prospects of graduates.

Public Interest in geography

In 2012, the American Geographical Society surveyed adult U. S. residents nationwide on their understanding of the discipline and appreciation for geography and geographic education. We found an overwhelmingly strong pro-geography constituency. Asked to compare geography to reading, writing, and mathematics, two-thirds of a key cohort said geography was just as important. That's an astounding affirmation, considering the high regard most people have for "the 3 Rs." Geography fared even better when compared to representative physical sciences and social sciences.

The AGS Geographic Knowledge and Values Survey findings suggest that an American pro-geography constituency would support increased funding for geography education and stricter standards that would require students to take more geography courses taught by instructors educated in geography. These results suggest a substantial mandate for increasing the standing of the U. S. in geographic literacy so that American citizens will be well-trained for the global workforce and can successfully engage in an increasingly inter-connected society.

The implications for colleges and universities are clear, as well, because primary and secondary education cannot be improved without concomitant improvements in higher

education. States will need to establish rigorous standards for geography teachers, and schools of education will need to respond with an adequate supply of teachers steeped in geography. Any attempt to improve geographic competence in the U. S. labor force will require even more dramatic improvements in undergraduate and graduate programs.

We concluded that, to meet educational and vocational goals, scholarships should be available to support the best and brightest students who choose to pursue undergraduate and graduate degrees in geographic education and research. Grants should be available to encourage substantially increased geographic research, including fieldwork, both foreign and domestic, by faculty and students. Development grants should be available to upgrade or create geography faculties throughout the nation; ensure topical, regional, methodological, and technological coverage; upgrade geographic technology; and promote community outreach. It is encouraging to learn that the University of Alabama is pursuing such advances on its own volition.

Popular Geographics

We presently are witnessing a societal movement of massive proportions. There is enormous public enthusiasm for popular geographics—the nebulous collection of geographic technologies, such as Google Earth and spatially enabled social networking, that can be understood and employed at little or no cost without much formal training. This amounts to a democratization of geography and promises to inspire increased support for geography at all levels K through Ph. D.

Workforce Needs and Jobs for Geographers

In 2014, the fastest growing job title in Utah and Kansas was “geographer.”

If ever there was any question that geography is among the foremost of professions, the last shred of doubt has been dispelled by reports on employment trends over the past decade. The U. S. Department of Labor, *The Guardian* newspaper, MSN.com, *Money Magazine*, and PayScale.com stated our case better than geographers themselves normally do.

MSN.com in its Money section on May 5, 2014 covered “America’s most and least common jobs.” Geography was among the least common, and I’ll talk about that aspect later, but there was good news too, “Still, some of these uncommon jobs do have growth potential and

include relatively high salaries." The data cited by MSN.com came from the U. S. Bureau of Labor Statistics (BLS). "The average geographer earned more than \$75,000 annually as of 2013." What's more, "The BLS forecasts that these jobs will grow by 29 percent . . . between 2012 and 2022."

On April 22, 2012, Debra Auerbach of CareerBuilder.com wrote about "10 jobs with above average salaries." Then at \$74,170, geographers were second highest, and all jobs on the list were projected to grow more than 29 percent over the subsequent decade. Auerbach explained, "Geographers study the earth and its land, features and inhabitants. They also examine political and cultural structures as they relate to geography. This is a good occupation for lovers of travel, as geographers often travel to conduct fieldwork." In 2010, *The Guardian* published a poll showing that geography graduates had the very lowest unemployment rate of all disciplines in the United Kingdom (<http://careers.theguardian.com/careers-blog/experts-view-why-are-certain-grads-less-likely-to-be-unemployed>). Among the previous year's graduates, 7.4 % of geographers were unemployed in January 2010, compared to 16.3 % of information technology (IT) graduates.

"What makes . . . geography grads the most employable?" Alison White asked, and the answer came from Nick Keeley, director of the Careers Service at Newcastle University, "Studying geography arms graduates with a mix of skills employers want to see: Geography students generally do well in terms of their relatively low unemployment rates. You could attribute this to the fact that the degree helps develop a whole range of employability skills including numeracy, teamwork through regular field trips, analytical skills in the lab and a certain technical savviness through using various specialist computing applications. Also, the subject area in itself cultivates a world view and a certain cultural sensitivity. These all potentially help a geographer to stand out in the labour market." For many years the U.S. Department of Labor has recognized geospatial technology as one of the three top growth industries today, alongside nanotechnology and biotechnology. "Over 500,000 professionals in fields ranging from environmental engineer to retail trade analysis are asked to use GIS in their jobs. The Bureau of Labor Statistics show that surveyors, cartographers, and photogrammetrists (a subset of GIS occupations) are experiencing faster than average employment growth - anticipating growth at 19 percent between 2008 and 2018." (http://www.dol.gov/brg/indprof/geospatial_profile.cfm).

Money Magazine and PayScale.com placed "geographic information system analyst" in its

list of the "Top 100 Best Jobs in America" in 2010. The 2011 list of the "Best Jobs in Fast-Growth Fields" included various careers that utilize GIS.

Certainly the majority of these jobs will be filled by graduates at the Bachelor's level, but demands for Masters and Doctorates are high compared to most other disciplines. Plus, the prestige and practical aspects of having a Doctoral program with active research projects will enhance the attractiveness of all graduates to employers.

The state of the world in regard to geography

Your proposal offers an accurate and effective evaluation of where Alabama stands within the United States. An even more compelling case can be made that the United States needs Alabama (and other states) to step forward in geography. Consider, for instance, that Oxford and Cambridge Universities have prominent Ph. D. granting geography departments, yet Harvard has none. Moscow State University has 15 geography departments, yet no viable geography departments remain in the top 20 private universities in the U. S. Prince William has a Master's Degree in geography, and Vladimir Putin is the Chairman of the Board of Trustees of the Russian Geographical Society, yet no president since Lyndon Johnson graduated from a university that currently has a geography department. Numerous studies show that American students today have extremely low levels of geographic knowledge, even when geographic literacy is defined merely as knowing place names and locations.

With only 67 Ph. D. granting universities in the U. S., the lack of knowledge, analytical capability, and intellectual capacity has caused incalculable damage to the nation and the world in science and society. The result is painfully predictable for anyone who values education. In foreign policy, American interests at home and abroad have been severely damaged by geographic ignorance. We the People made uninformed choices about going to war (Vietnam, Iraq). We sent troops into battle unprepared for what they faced culturally (Iraq, Afghanistan) and physically (hostage rescue attempt in Iran). We misjudged the national will of adversaries (China crossing the Yalu River in 1950, the worst land warfare defeat in U. S. history). We failed to account for deep-seated hatreds among cultures (Sunni vs. Shia in Iraq). We underestimated the commitments and capabilities of adversaries (Vietnam, Beirut,

Mogadishu, Afghanistan). We alienated allies (Europe regarding Iraq). We ignored clear warnings by prominent geographers (Isaiah Bowman on Vietnam, Harm de Blij on Saddam Hussein's intention to invade Kuwait). Occasionally, warfighters embarrassed our country, hurt national interests, or died because they did not understand foreign cultures, customs, and sensitivities (Iraq, Afghanistan). Occasionally, analysts misused or failed to use geographic technologies with tragic results (bombing the Chinese Embassy in Belgrade). Most recently we failed to understand North African societies sufficiently to anticipate the Arab Spring.

Conspicuously missing in every case has been the kind of understanding that geographers spend their careers developing and teaching, even in introductory classes. In each case, some wise people in government—geographers and others—warned decision makers, but there was practically *no public debate* over alternative actions and consequences until after the damage was done. In each case, there was *no public constituency* to support those in government who did understand. An informed public is essential to democracy, but, when it comes to foreign policy, the U. S. doesn't have one. That applies to voters, journalists, analysts, policy makers, and politicians.

In his popular, non-fiction book *The Fourth Part of the World*, science writer Toby Lester (an editor of *The Atlantic* and not a geographer himself) credits geography with informing, inspiring, and motivating the Renaissance. Kudos to Alabama for keeping that beacon burning!

I am honored that you invited me to review and comment on this vital step forward for the University of Alabama and the nation.

Sincerely,



Jerome E. Dobson, Professor Emeritus of Geography, University of Kansas and President, American Geographical Society

**University of Alabama System Outline for New Program Proposal (Supplement): Supporting Material
for Part 6:**



April 6, 2016

Professor Douglas Sherman
Chair, Department of Geography
University of Alabama
Tuscaloosa, Alabama 35487-0322

Dear Professor Sherman,

In my capacity as a Past President of the American Association of Geographers and as chair of that organization's Healthy Department's Committee, I am writing to express my strong endorsement of your proposal for a new PhD program in geography at the University of Alabama. In my view this would be a particularly auspicious time to launch a new doctoral program in geography in Alabama given the growing recognition of the discipline's pedagogic and social importance, the rapidly expanding cadre of students interested in geographic matters, and the strength of Alabama's geography program. Expanding the cadre of individuals with advanced understanding of geography is critical to meeting some of the most pressing pedagogic and research challenges of our time. As you well know, the discipline of geography is sometimes poorly understood in the United States—a reflection, in part, of a period during which geography was marginalized in the U.S. educational system. However, attention to geography is rising rapidly in recent years in the wake of growing awareness of the critical need to advance understanding of the interconnections between humans and the environment and between peoples and places around the world. At a time when the United States is struggling to develop better ways to confront environmental change, advance economically, and engage effectively with other parts of the globe, advanced geographical training has never been more needed.

Fortunately, geography in the U.S. is undergoing a renaissance of sorts. Over the past two decades students have flocked to geography degree programs in record numbers, existing geography departments have expanded, and new geography programs have sprung up. The Department of Geography at the University of Alabama is well positioned to benefit from, and contribute to, these developments. Your department is already known as for its research and teaching on matters pertaining to the interconnectivity of human and physical systems and for the ways in which geospatial technologies can be used to advance understanding of our changing planet. Were you to launch a PhD

program you would be able to hit the ground running, and capitalize on the growing awareness of the contributions geography can make to education, scholarly research, and policy making.

The strategic nature of your initiative is underscored by the findings of a 2010 study of the National Academy of Sciences—National Research Council that I chaired. Entitled *Understanding the Changing Planet: Strategic Directions for the Geographical Sciences*, the study looks at the many ways the geographical sciences are contributing to efforts to address major societal needs—ways that are very much in keeping with the research and teaching going on at the University of Alabama. The study also draws attention to the critical importance of developing a more geographically literate society and research community if we are to address many of the pressing challenges of our time.

At least three key points bear emphasis when considering the value of building a doctoral program in geography at your institution:

- There is a pressing need for educators who can help the next generation of students develop a stronger grasp of the world around them. Students desperately need a more sophisticated understanding of the cultural, economic, and environmental patterns and processes that lie at the heart of the geography curriculum. As the interrelatedness of issues and problems becomes increasingly apparent, the value of geography's integrative approach has never been clearer. That helps to explain the phenomenal success of the relatively new Advanced Placement program in human geography in the nation's high schools (3000 students in 2001; close to 200,000 in 2015-2016). This success translates into a growing number of high school students entering colleges and universities looking to major in geography—with self-evident positive ripple effects for graduate programs in geography.
- The past two decades have seen an explosion in the development and use of geographic technologies. Geographic information systems (GIS) have become key tools for land use decision-making, environmental protection, marketing analysis, disaster management, epidemiological analysis, and much more. Moreover, geographic technologies provide a core platform for interdisciplinary research and collaboration within the university and beyond. Since the products of GIS are no better than the quality of the geographic conceptualizations that go into the construction of each data layer, a growing number of individual with advanced training at the intersection of geography and GIScience is exactly what is needed to address the need for more and better-trained researchers with expertise in the geographical sciences.
- As a direct follow-on from the former points, employment opportunities for geographers have been growing. Individuals with advanced geographic training are finding their skills in demand in planning agencies, policy institutes, educational institutions, development agencies, and many other venues. The graduates of a new doctoral program in geography at the University of Alabama would be in a strong position to find employment and contribute to society's efforts to address a range of social and environmental challenges.

In short, a strong doctoral program in geography would be an asset to your institution, the State of Alabama, and the discipline of geography. If your proposal for a new doctoral program is successful, I am convinced the program will pay dividends at a time when more and more students are gravitating toward geography, and when geographic expertise is in high demand. The American Association of

Geographers is excited by the prospect of a new PhD program in geography at the University of Alabama, and we stand ready to be of help to you in any way we can.

Sincerely,

A handwritten signature in dark ink, appearing to read "Alex B. Murphy", with a stylized flourish at the end.

Alexander B. Murphy
Professor of Geography & Rippey Chair in Liberal Art and Sciences
University of Oregon

Chair, Healthy Departments Committee, Association of American Geographers
Past President, Association of American Geographers