

Spring 2017

# Geography 2017 APR Self-Study & Documents

University of New Mexico

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**ACADEMIC PROGRAM REVIEW  
SELF-STUDY, JANUARY 2017**

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## Introductory Section and Background Information

*The section should provide a brief introduction to the self-study, which includes the following elements:*

### **0A. An executive Summary that provides a one to two-page summary/abstract of the information contained within the self-study.**

This self-study describes and evaluates the Department of Geography & Environmental Studies at UNM, as understood by its own faculty members. The report is meant both to highlight important transitions that have been implemented in the last five years, while simultaneously looking forward to the department's next 5-10 years. Despite challenges that obviously loom – for GES, for UNM, and for virtually all institutions of higher education – the department is on strong footing and proceeds from a position of optimism.

Introduction – The Introductory section describes the department's overall characteristics and reviews the many recommendations that were made at the time of the most recent Academic Program Review (2008). Actions taken in response to that review are described, including initiatives that remain incomplete.

Program Goals – The Criterion One section explains how GES views its role at UNM and in the College of Arts & Sciences. It describes constituents and details program and learning goals.

Curriculum – The Criterion Two section describes curricula for all GES programs, including a lengthy section on potential revisions that are currently under consideration.

Continuous Improvement – The Criterion Three section presents our practices for assessing student learning outcomes and using assessment results to improve our pedagogy.

Students – The Criterion Four section describes GES students, traces enrollment and graduation trends, and explains various demographic patterns and their impacts.

Faculty – The Criterion Five section describes GES faculty characteristics and credentials.

Resources and Planning – The Criterion Six section reviews GES budgets, facilities and personnel, reviewing both the recent improvements in resources and the ongoing need for augmentation.

Facilities – The Criterion Seven section characterizes all current and needed GES facilities.

Program Comparison – The Criterion Eight section compares GES to nationwide peer programs.

Future Direction – The Criterion Nine section presents a proposed GES strategic plan, on which we hope the APR reviewers will provide direct feedback and commentary.

## **0B. A brief description of the history of each program within the unit.**

This section provides a brief history of GES in the last 16 years (spanning two previous Academic Program Reviews), while a deep history of Geography at UNM is included as Appendix J.

### Snapshot: AY2000-2001

In the 2000/2001 academic year the Department of Geography had seven faculty members and had a growing number of undergraduate majors (47) and graduate students (26). A graduate program review was conducted that year and was generally favorable. Despite the favorable report, an acting Dean attempted to dismantle the department. The attempt failed, but the department lost three faculty members. Many students subsequently left the program or failed to enter it because of persistent rumors of the department's demise. A large part-time faculty budget was used to fill the gap, allowing for recovery of some majors despite the faculty size having been reduced to four.

### Snapshot: AY2006-2007

In 2006, three outside reviewers visited GES and made suggestions for future directions. On the basis of their report and recommendations, the department was allowed to hire new faculty members that year as replacements for retirements. These hires, in conjunction with changes in the Dean's office, allowed the department to begin a sustained rejuvenation process. A strategic plan was developed after the external review, and an APR the following year served as a detailed review of its implementation plan.

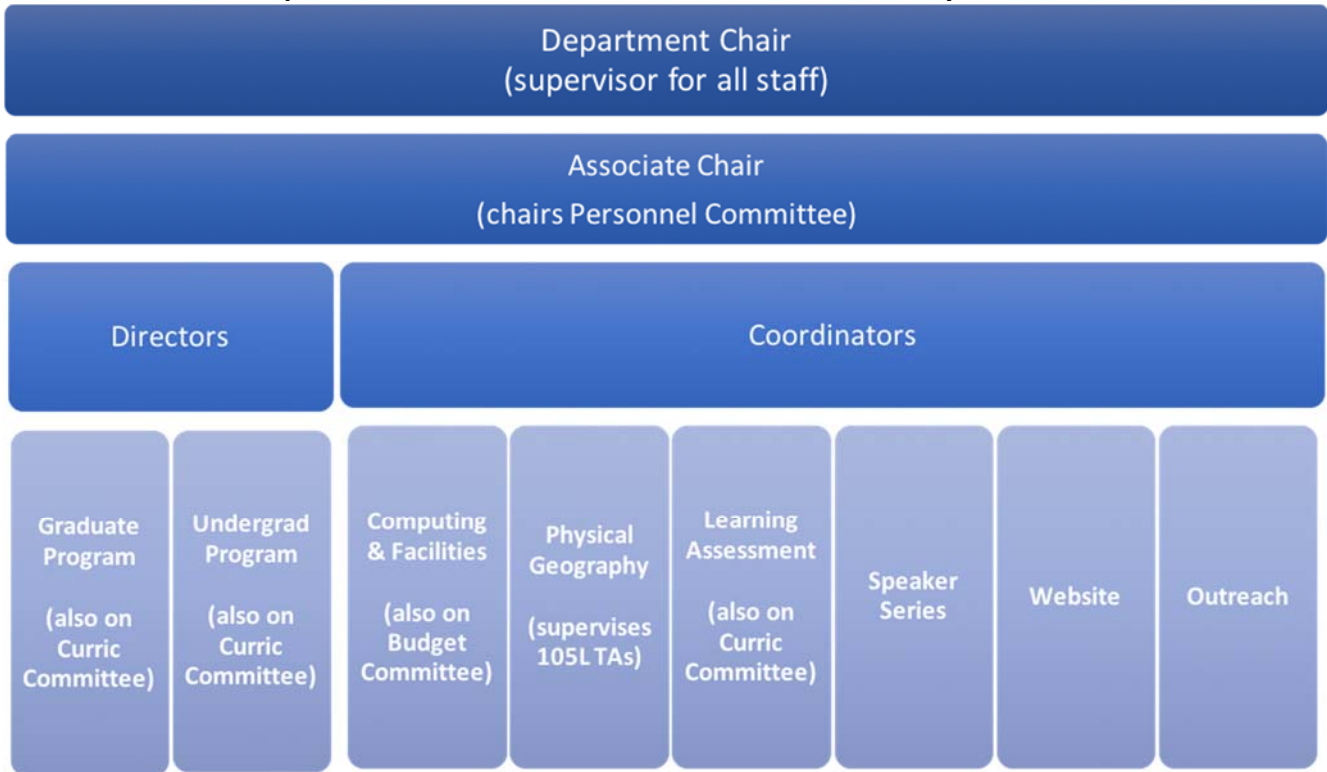
### Snapshot: AY2015-2016

As of this writing, there is only one person on the GES faculty who was at UNM during the 2006-2007 external review and the 2007-2008 APR (having arrived in GES in Fall 2006). This wholesale faculty turnover has allowed the department to rethink its curricula, reorient its scholarship, and reclaim its standing at UNM by providing an interdisciplinary bridge between UNM's many spatially- and environmentally-oriented units. Nearly all of the recommendations of the 2008 APR action plan have been implemented since 2008 (with a noticeable failure to develop additional financial resources), and the department has recently outlined a new strategic plan to guide the department's next 5-10 years.

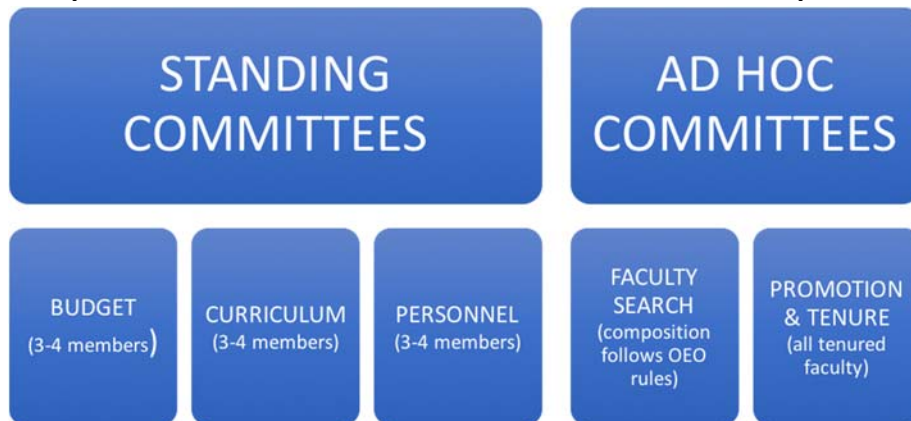
## **0C. A brief description of the organizational structure and governance of the unit, including a diagram of the organizational structure.**

The Department of Geography & Environmental Studies operated for many years with a flat, holistic governance model in which decision-making authority was delegated largely to the Chair, who consulted in many cases with the full faculty as a "committee of the whole." As the faculty size began to grow after 2008, this model became somewhat unwieldy, and a new governance model was adopted in 2014 to delegate authority to a variety of faculty directors, coordinators, and committees who are nominated annually by the Chair and ratified by vote of the full faculty. The organizational and governance structures are shown in the diagrams below, with descriptions of each position and committee available in the governance guidelines document (Appendix I).

### Department Governance Structure: Individual Faculty Positions



### Department Governance Structure: Committees and Composition



**0D. Information regarding specialized/external program accreditations associated with the unit including a summary of findings from the last review, if applicable. If not applicable, indicate that the unit does not have any specialized/external program accreditations.**

GES does not have any specialized or external program accreditations.

**0E. A brief description of the previous Academic Program Review for the unit. The description should note when the last review was conducted. The description should also provide a summary of the findings from the review team's final report, the resulting action plan to address the recommendations, and a summary of actions taken as a result of the previous academic program review.**

The most recent APR for GES was conducted in February 2008. The primary recommendations and resulting actions are listed below, by criteria.

### **Criterion One: Program Goals**

#### *Program Focus*

- Recommendation: Narrow curricular foci to include only GIScience and Environmental Management, to ensure adequate support/quality despite small faculty size
- Actions: Curriculum changes approved April 2009 to narrow programs' focus. Ongoing curriculum revision has generally maintained the narrower focus, although we have since re-created urban geography courses that were eliminated in 2009 and also added a specialization in legal geography

#### *PhD Program*

- Recommendation: Stabilize MS Geography program first; then work to develop PhD program.
- Actions: Intensive planning effort in 2014-15 included joint UNM-NMSU retreat, curricular working groups, focus groups with potential employers, surveys of regional source programs, and consultation with units across UNM campus. Proposal submitted for UNM review in January 2016.

### **Criterion Two: Teaching and Learning: Curriculum**

#### *BA degree*

- Recommendation: Revise BA degree to reflect environmental management focus
- Actions: Changes approved April 2009. Ongoing curriculum revision maintains environmental studies focus, although courses have been added in urban & legal geography. Fall 2015 curriculum proposal submitted: revise title of GEOG195 to become "Introduction to Environmental Studies"

#### *Concentrations*

- Recommendation: Implement approved concentrations in Environmental Management and GIScience at MS level
- Actions: Curriculum approved April 2009. No change since then.

#### *BS degree*

- Recommendation: Revise BS degree to reflect GI Science focus
- Actions: Changes approved April 2009. Ongoing curriculum revision maintains GIScience focus.

#### *Physical Geography courses*

- Recommendation: Combine Physical Geography Lecture (101) with Lab (105L) making lab required.
- Actions: These courses were combined (as co-requisites) in Fall 2009 but were later separated in Fall 2011 due to concerns about enrollment totals.

#### *Overall Curriculum Revisions*

- Recommendation: Narrow focus -- drop and add courses; develop matrix to balance offerings; update graduate curriculum with two-course graduate core sequence and evaluation of 4/500 level offerings.

- Actions: Changes approved April 2009. Ongoing curriculum revision has generally followed this model, although an evaluation of 4/500-level offerings has not yet been conducted. Ongoing revisions to streamline curriculum and improve path to graduation.

#### *GIScience*

- Recommendation: A graduate certificate and undergraduate minor in GIScience would be of great benefit to UNM. These are very common in other universities.
- Action: GIScience minor was added in 2010. Potential for grad certificate program was evaluated in detail in 2015; faculty consensus was to hold off on pursuing this further due to concerns about low overall administrative capacity in the department.

### **Criterion Three: Teaching and Learning: Continuous Improvement**

The 2008-2009 APR action plan did not include any goals related to learning outcomes assessment.

### **Criterion Four: Students**

#### *TA Lines*

- Recommendation: Add three new TA lines immediately, with more needed at a later date.
- Action: Two new TA lines committed for 2015-16 by A&S. More needed and requested as part of PhD program proposal.

#### *Physical Geography Coordination*

- Recommendation: Improve coordination of TA-led labs and faculty oversight of TAs.
- Action: Created new faculty position for Physical Geography lab coordinator. Meets with and supervises TAs.

#### *Web Page*

- Recommendation: Improve website immediately.
- Action: Two iterations of the GES website since 2008 have made improvements; new staff person (Network Tech) hired in 2015 has taken this on as a regular job duty.

#### *Graduate Recruiting*

- Recommendation: Engage in purposeful recruiting of graduate students, rather than relying on applications solely from UNM Geography grads or place-bound Albuquerque professionals.
- Action: Since 2009, faculty have been asked to focus on conference visibility, but this effort has been hampered by a lack of funding. Recruitment funding received from OGS in 2015 had a massive positive impact on recruitment, leading to the highest-quality-ever cohort starting the MS program in fall 2015.

### **Criterion Five: Faculty**

#### *Department Chair*

- Recommendation: Hire a new outside Department Chair at the Associate Professor or Professor level.
- Action: External searches for new Department Chair were conducted in 2008-09 and 2009-10. Freundsuhh hired as external chair in August 2010.

#### *Lecturer III*

- Recommendation: Replace the Lecturer III who left in July 2008 on short notice. Replacement should teach in GIScience as recommended by the review team.

- Action: Halftime lecturer (Seidler, urban planning) hired in 2013 after two retirements (Matthews and Cullen).

#### *Additional faculty*

- Recommendation: Add additional faculty who specialize in GIScience and could contribute to Physical Geography.
- Action: Spousal hires in 2009 (Benson, resource mgmt.), 2010 (Carr, urban geography), 2011 (Hadjilambrinos, energy policy), and 2014 (Lippitt, GIScience and physical geography) have constituted the bulk of our faculty growth. We also made two non-spousal hires (Lippitt in 2012 and Lin in 2016) in GIScience and remote sensing. There is still a need for additional faculty support in GIScience.

### **Criterion Six: Resources and Planning**

#### *Office support*

- Recommendation: The Department has one department administrator who cannot currently keep up with the Department's administrative workload. An additional staff person should be added.
- Action: Negotiation with A&S resulted in commitment of support from the College in research administration, as of spring 2015. This made an immediate positive impact on DA workloads and PI satisfaction, but it does not represent a long-term solution for understaffing.

#### *Lab Support*

- Recommendation: Geography has major computer lab facilities which need to be maintained, and there is a need for a campus wide GIScience help desk. As a starting point, this could be done by one person.
- Action: A course fee revision proposal was submitted in fall 2014 to provide additional revenue that could be used to fund this position. A full-time lab manager was hired in summer 2015 to provide direct computing and research support to students.

#### *Advising*

- Recommendation: The department needs additional advising capacity to support students. This may be possible in conjunction with the College's long-term advising plan.
- Action: Advising responsibility has been assigned to departmental faculty (the grad and undergrad program directors) in the absence of an advising staff person who can dedicate time directly to GES.

#### *Outreach*

- Recommendation: Establish a newsletter publication for purposes of alumni outreach.
- Action: Occasional newsletter production has occurred (twice since 2009), but it was never implemented as a long-term plan. A decision was made in collaboration with A&S Development Office in 2015 to focus on targeted contacts/solicitations, rather than broadcast newsletters.

#### *Fundraising*

- Recommendation: Department should change the purpose of the Murphy endowment. Department should also develop a plan for other endowments.
- Action: Murphy endowment was re-designated for speaker series, which has raised GES campus profile. A long-term development plan has not yet been implemented. May eventually create a donor group.



## **Criterion Seven: Facilities**

### *Equipment*

- Recommendation: Develop a long-term plan for funding equipment purchases, maintenance, and updates.
- Action: A sustainable plan for funding equipment maintenance and purchases was not immediately developed, although EU monies were depleted to update lab hardware in 2013. Course fees were revised in fall 2014 to add a \$50/course undergraduate curriculum fee, which is projected to generate ~\$68,000/year. These funds have already supported the hire of a lab manager and are earmarked for replacing lab computers on a reasonable timeline.

### *Software*

- Recommendation: Develop a long-term plan for funding software licensing and support.
- Action: Software needs are now funded with curriculum fee revenue.

### *Laboratory space*

- Recommendation: Remodel Rooms 105, 106a, 106b, 106c, and 106d in Bandelier East to modernize aging facility and reconfigure it to support both classes and independent student work.
- Action: Floors were refinished, but a remodel was never implemented, despite being desperately needed.

## **Criterion Eight: Program Comparison**

The 2008-2009 APR process did not include program comparison.

## **Criterion Nine: Future Directions**

No recommendations were made regarding the strategic planning process.

## Criterion 1. Program Goals

*The unit should have stated learning goals for each program and demonstrate how the goals align with the vision and mission of the unit and of the university. (Differentiate by program where appropriate.)*

### **1A. Provide a brief overview of the vision and mission of the unit and how each program fits into the vision and mission of the unit.**

#### Mission Statement

We are an energetic and revitalized department that is passionate about our teaching and research in human geography and the environment, and in Geographic Information Science. We provide innovative curricular programs that are relevant to current, real-world problems, and that are strongly coupled with our individual research expertise. This synergy is nurtured by our commitments to intellectual diversity, collegiality and scholarly excellence in coherent focus areas within the disciplines of geography and environmental studies.

#### Goals and Vision

1. To be an integral part of the workings and be an active contributor to the mission of the University of New Mexico.
2. To improve its recognition and reputation amongst departments of Geography and Environmental Studies in the region and nationally.
3. To maintain a high level of research and teaching.
4. To provide academic leadership at UNM, particularly in the areas of Geographic Information Science and environmental understanding.
5. To provide a comprehensive offering of degree programs including professional certificates, undergraduate majors and minors, and graduate degrees.

#### Overall Strategy

Achieving this mission requires effective teaching, excellent research, active participation in university governance, and leadership in professional associations.

#### Program Overview

- BA Geography – focus on Environmental Studies
- BS Geography – focus on Geographic Information Science
- Undergraduate minor – Geography
- Undergraduate minor – Geographic Information Science
- Undergraduate minor – Law, Environment, and Geography
- Shared-credit program – “3/2” with Economics leads to BA-ECON and MS GEOG in 5 years
- MS Geography – separate tracks in Environmental Studies, Geographic Information Science
- Graduate certificate – Law, Environment, and Geography
- PhD Geography [proposed] – New Mexico Joint Doctoral Program in Geography (with NMSU)

#### Program Description

Our BA and BS programs offer two different tracks in undergraduate education (one with a social-science focus on human-environment interaction and one with a more technical focus on mapping and geospatial analysis), but both degree tracks purposely incorporate aspects of the other focus. We also offer a variety of undergraduate minors (Geography; Geographic Information Science; Law, Environment & Geography) and a shared-credit program (with Economics) that allow for development

of specialized skills in conjunction with other majors at UNM. Our master's program offers a research-based degree focused on the intersection of Environmental Studies and GIScience, integrating both theory and application. We also offer a graduate certificate in Law, Environment, and Geography, which is designed to help graduate students synthesize the legal-environmental aspects of their work in a variety of disciplines. All of these programs are designed and administered to maximize integration with other units at UNM, to provide academic leadership on environment-related research at UNM, and to prepare students for a variety of professional/leadership positions after graduation, especially related to environmental issues. This is particularly evident in our current proposal with NMSU to add a joint PhD program in Geography, which will be offered collaboratively by the two universities.

**1B. Describe the relationship of the unit's vision and mission to UNM's vision and mission.**

The University of New Mexico's *UNM 2020 a View to the Horizon* articulates UNM's mission, its vision, and its institution-wide strategies and goals for realizing this plan. See below for how GES relates to the key components of UNM 2020.

Discovery and Innovation

UNM 2020 envisions the University as a leader in "basic and applied research and the translation of that research into knowledge and applications of value to academic communities and the public." A fundamental part of this vision is the spread of interdisciplinary teams that focus on some of the most important social challenges of our time. All of our programs in GES are premised upon integrative, interdisciplinary, multi-methodology research and education.

Students: The Lobo Experience

UNM 2020 envisions the University as an institutional leader in creating multidimensional programs "that go far beyond 'segmentation' initiatives' to more inclusive topic, challenge, skill and competency based sharing that brings diverse perspectives to challenges shared by all." By requiring that students in Environmental Studies learn GIScience techniques, and vice versa, our GES programs stress the very kind of topic-, challenge-, skill- and competency-based sharing that is at the heart of the "Lobo Experience" vision for students.

Strategic Partnerships

UNM 2020 envisions the University as engaging in a robust network of relations with other educational institutions as well as a system of public/private initiatives as part of a broader effort to "define new relationships that hold promise against society's most complex challenges." Our effort to build the New Mexico Joint Doctoral Program in Geography shows the deep GES commitment to this UNM goal. This will build on existing partnerships with such key institutions as the National Park Service, the Bureau of Land Management, the Sevilleta Long-Term Ecological Research Programs, the Earth Data Analysis Center, NM Department of Transportation, and the New Mexico Collaborative Research and Development Council (NM-CRDC, organized by New Mexico's U.S. Senators Martin Heinrich and Tom Udall).

Market Position and Brand

UNM 2020 envisions the University as building its market position and brand on a reputation as a destination university that provides "tremendous value to state, national, and global students seeking an education relevant to diverse social and economic environments." By focusing our programs (including the planned PhD program) explicitly on theories and applications relevant to social and environmental issues in the American Southwest, GES has the potential to draw and serve students from around the world who want to develop integrative competencies in a particularly multicultural, and environmentally critical context.

**1B (reflection question): In order for the university to better showcase your unit, please explain the importance of its contribution to the wellbeing of the university including the impact of the unit's degree/certificate programs on relevant disciplines/fields, locally, regionally, nationally, and/or internationally?**

It has become increasingly clear that finding solutions to some of the most difficult environmental problems will require highly skilled professionals with multiple disciplinary perspectives. National-level research bodies – like the National Science Foundation and the National Research Council – now acknowledge the fundamental necessity of interdisciplinary perspectives that cross spatial scales. Geography, as a discipline, is uniquely poised to provide the interdisciplinary academic and institutional links that can underpin new modes of thinking and research. With courses and research agendas that span natural science, social sciences, humanities, and engineering, GES expects to play a critical role at UNM in the recruitment, training, and development of skilled student-researchers who understand the interdependence of theory and practice, who can solve complex real-world problems, and who are capable of thinking in integrative ways about human-environment dynamics. Our faculty already engage in cutting-edge research with national and international profiles, and we have worked hard to develop new programs that intersect with other campus units from a variety of disciplines (e.g. the undergraduate minor and graduate certificate in Law, Environment, and Geography). From water resource issues, rapid urban growth, and urban/wildland interface conflicts to questions about the appropriate use of public lands, mining impacts and “sacrifice zones,” the Southwest is a hotbed of cultural and environmental complexity that requires new research approaches to effectively understand and address associated challenges. GES hopes its courses and researchers will be at the center of UNM efforts to meet these challenges head-on.

**1C. List the overall learning goals for each undergraduate and/or graduate program within the unit. In accordance with the Higher Learning Commission's Criteria for Accreditation, student learning goals and outcomes should be articulated and differentiated for each undergraduate and graduate degree/certificate program.**

Geography and Environmental Studies has three degree programs: a B.S., a B.A., and an M.S. degree. The broad learning goals are the same for the three degree programs. The primary difference between the two undergraduate degrees is the greater emphasis placed by the B.S. degree on quantitative methods and geographic information science (GIS). This difference in emphasis is reflected in different student learning outcomes (SLOs) and measurement processes for goal C for each of the two degrees. The Master of Science degree places much greater emphasis on research than the undergraduate degrees. This is reflected in substantially different learning outcomes and measuring processes for all five broad learning goals.

The three Geography and Environmental Studies degree programs have the following five distinct student learning goals:

- A. Students will develop an ability to see meaning in the arrangement of things in space.
- B. Students will become geographical problem-solvers capable of using qualitative, quantitative and/or spatial methods of research appropriate to their level of training.
- C. Students will develop an ability to see meaningful relationships between people, places, and the environment.
- D. Students will become clear and effective communicators.
- E. Students will gain preparedness for professional careers in geography and allied fields.

**1D. Explain the manner in which learning goals are communicated to students and provide specific examples.**

Learning goals for the department's degree programs, as well as for courses in the University's General Education curriculum are posted on the department's web site. In addition, representatives from Geography and Environmental Studies' student organization, which includes undergraduate and graduate students, participate in departmental faculty meetings and deliberations in all matters (other than personnel matters). The student representatives communicate learning goals, outcomes, and the results of on-going assessment processes to the GES student body as a whole. They also are actively engaged in all discussions pertaining to the process of degree program and course assessment and improvement.

**1E. Describe the unit's primary constituents and stakeholders.**

Internal GES Constituents

Internally, our primary constituents are students, faculty and staff.

- **GES Students:** Our M.S. Geography students typically come from non-Geography backgrounds and from outside UNM, although at least one student each year moves from our undergraduate program into the M.S. Geography program. We also currently host several Ph.D. students in Latin American Studies who have declared GES as a concentration. Our undergraduate majors are split between the two majors (BA and BS), with a bias toward the BS based on strong student interest in the professional opportunities afforded by expertise in mapping and spatial analysis.
- **Non-GES Students:** Through our lower-level core courses and upper-level offerings, we also serve a wide variety of students from outside the Geography majors. These students come from a wide variety of majors, with emphasis on environment-oriented disciplines.
- **Faculty:** GES is dominated by tenure-track faculty who are generally at the early or mid-career stage. (We have only one full professor.) We have a Visiting Assistant Professor in 2016-17 whom we hope to convert to a Lecturer next year, as we just lost our only Lecturer to retirement (December 2016). We have several regular part-time instructors who are practicing professionals or recent retirees from tenure-track faculty positions elsewhere. Finally, we have a very sizeable affiliated faculty, including primarily UNM tenure-track faculty in other departments who cross-list courses with GES, attend our colloquia, serve on our student committees, or engage in regular research collaborations with GES faculty and students.
- **Staff:** GES has only two regular staff members – a department administrator who oversees all logistics related to fiscal, personnel, and academic processing issues; and a lab tech who manages our student computing facility and provides student research support. We also rely on a variety of research and teaching assistants drawn almost entirely from the ranks of our own MS program, as well as a small number of undergraduate student employees who work in the computing lab on a part-time basis.

## Institutional Constituents at UNM

Institutionally, we have a number of stakeholders in UNM's colleges and departments that list GES-offered courses within their degree program offerings:

- **Department of American Studies** – includes Geographic Studies as one of six areas in which undergraduate students may take “Interdepartmental Studies of American Culture”
- **Community and Regional Planning Program** – includes three GEOG courses as “physical world” electives within the Bachelor of Arts in Environmental Planning and Design
- **Department of Earth and Planetary Sciences** – includes 3 GES courses as electives in the “Spatial Analysis” track for the Environmental Science B.S. degree
- **Department of Economics** – has worked with us to develop a collaboratively offered “3/2” shared-credit program in which students earn a BA in Economics and an MS in Geography just five years.
- **College of Education** – includes multiple GEOG courses as either requirements or electives for its undergraduate degree program concentrations in Social Studies and in Secondary Education.
- **School of Engineering** – has worked with us to standardize a cross-listed offering of ME217/GEOG217 “Energy, Environment, and Society”
- **Water Resources Program** – includes GEOG courses as electives, and has discussed the possibility of standardizing a grad-level offering of our Water Resources Management course.

We also engage with multiple UNM units as research partners on proposals and funded projects across a wide span of environmental, technical, and interdisciplinary topics, including these examples from the last few years:

- **Department of Anthropology**, College of Arts & Sciences – proposals and projects related to spatial analysis, remote sensing, and archaeology
- **Department of Biology**, College of Arts & Sciences – proposals and projects related to environmental monitoring and landscape-change modeling
- **Department of Civil Engineering**, School of Engineering – proposals and projects related to hydrological analysis, infrastructure assessment, and resilience-based planning
- **Program in Community and Regional Planning**, School of Architecture & Planning – proposals and projects related to sustainable urban design and planning
- **Department of Earth and Planetary Science**, College of Arts & Sciences – proposals and projects related to water quality monitoring and modeling
- **Department of Economics**, College of Arts & Sciences – proposals and projects related to the assessment and implementation of resilience-based development
- **Department of History**, College of Arts & Sciences – proposals and projects related to interdisciplinary study of sites in the Southwest, and development of a Spatial Humanities working group and potential institute
- **Department of Linguistics**, College of Arts & Sciences – proposals and projects related to linguistic mapping and spatial analysis
- **Resilience Institute**, School of Engineering – proposals and projects related to resilience-based theory and planning for a range of community-based applications

## External Constituents

Externally, GES maintains research partnerships with a number of external organizations that have a vested interest in the department's success, including:

- NM Department of Transportation
- USGS Jemez Mountains Field Station
- US Fish & Wildlife Service
- Bureau of Land Management
- Long-Term Ecological Research Network

We are also involved as members, attendees, and elected officers in a variety of professional organizations that benefit from department success, including:

- American Association of Geographers (AAG)
- Southwest Division of the AAG (SWAAG)
- American Society of Photogrammetry and Remote Sensing (ASPRS)
- Rio Grande Chapter of the ASPRS
- Coalition of Geospatial Organizations (COGO)
- Cartography and Geographic Information Society (CAGIS)

Finally, the Department of GES at UNM enjoys a special relationship with the Department of Geography at New Mexico State University, since the two departments are currently collaborating on a proposal to offer New Mexico's first doctoral program in Geography.

### **1F. Provide examples of how satisfaction of the program goals serves constituents.**

When GES achieves its goal "to be an integral part of the workings and be an active contributor to the mission of the University of New Mexico," the institution becomes stronger as a whole. In the process, UNM's individual units (and all of their/our constituents) benefit from GES attention to research and innovation that promotes student learning and attends to relevant social and environmental issues.

When GES achieves its goal "to improve its recognition and reputation amongst departments of Geography and Environmental Studies in the region and nationally," the discipline of Geography and its many professional and academic organizations benefits from having a strong center of academic excellence in a historically underserved state/region.

When GES achieves its goal "to maintain a high level of research and teaching," our many students (and those in other UNM units) benefit from meaningful classroom learning experiences and relevant research training. Our research partners benefit from GES contributions to projects of regional and national relevance.

When GES achieves its goal "to provide academic leadership at UNM, particularly in the areas of Geographic Information Science and environmental understanding," the institution is able to marshal resources more effectively and engage in coherent cross-disciplinary programming (e.g. the D2K or Data-to-Knowledge Initiative, or the Spatial Humanities Institute) that is enriched by GES leadership in both the theory and applications of spatial analysis and human-environment dynamics.

When GES achieves its goal “to provide a comprehensive offering of degree programs including professional certificates, undergraduate majors and minors, and graduate degrees,” students at all levels and in all UNM majors benefit from the variety of offerings to support professional and academic training in the environmental fields and in the Geographic Information Sciences.

**1G. Provide examples of outreach or community activities (local, regional, national, and/or international) offered by the unit. These could include activities such as colloquia, conferences, speaker series, performances, community service projects, etc. Provide an assessment of these activities in relation to the unit’s educational objectives.**

In terms of academic and professional outreach: our faculty are involved in a variety of initiatives through the organizations listed above as external constituents in 1E (AAG, SWAAG, ASPRS, COGO, CAGIS) and a variety of other disciplinary groups. More concretely, we hosted the 2014 SWAAG conference here in Albuquerque (jointly with the Great Plains/Rocky Mountain Division), which was a major showcase for GES and UNM. We also host a regular speaker series that is focused on cross-disciplinary outreach to the UNM and Albuquerque communities, and we organize outreach events annually in conjunction with the national Geography Awareness Week.

In terms of promoting geography in the community: our faculty regularly give guest lectures throughout Albuquerque, and we have recently begun to pursue funding for outreach programs that would link UNM with under-represented students in the Albuquerque area (at K-12 level as well as through smaller institutions of higher education).

For students: we have just launched a Gamma Theta Upsilon honors society, and we regularly sponsor student travel to conferences where they can present their research and engage with scholars at the regional and national levels.



## Criterion 2. Teaching and Learning: Curriculum

*The unit should demonstrate the relevance and impact of the curriculum associated with each program. (Differentiate for each undergraduate and graduate degree/certificate program and concentration offered by the unit.)*

**2A. Provide a detailed description of curricula for each program within the unit. Include a description of the general education component, required and program-specific components for both the undergraduate and graduate programs. Provide a brief justification for any bachelors degree programs within the unit that require over 120 credit hours for completion.**

GES does not have any bachelors degree programs that require more than 120 credit hours for completion. We are currently evaluating curricular changes to several of our existing programs, as described below in sections that follow the curriculum descriptions. For information about specific courses mentioned in the text/tables below, refer to Appendix A, which includes a complete list of all courses currently included in the official UNM catalog.

### General Education courses

GES currently has five courses in UNM's General Education core for undergraduate students:

- GEOG101 Home Planet – Physical and Natural Sciences
- GEOG102 People and Place – Social and Behavioral Sciences
- GEOG105L Home Planet Lab – Physical and Natural Sciences
- GEOG140 Introduction to World Regions – Humanities
- GEOG217 Energy, Environment and Society – Social and Behavioral Sciences

Beyond the changes that are currently under consideration by the New Mexico Higher Education Department, for General Education as a whole, we have recently considered revising our delivery options for these courses, as described below in the section on "Potential Revisions: General Education Courses."

### Bachelor of Arts, Geography

The B.A. major in Geography currently requires 38-39 credit hours of lower and upper-division course work. It is suitable for students interested in environmental careers. The current curricular structure is shown in the table below, with course-related changes proposed by the GES curriculum committee listed below in the section titled "Potential Revisions: Environmental Studies Courses." No structural changes are proposed for the B.A. program at this time.

Required curriculum: Bachelor of Arts, Geography		Hours
GEOG 101	Home Planet: Land, Water and Life	3
GEOG 105L	Home Planet: Land, Water and Life Laboratory	1
GEOG 102	People and Place	3
GEOG 140	Introduction to World Regions	3
GEOG 195	Introduction to Environmental Studies	3
GEOG 281	Introduction to Maps and Geospatial Information	3

GEOG **381L -or- GEOG *481L	Introduction to Geographic Information Systems Map Design and Geovisualization	4
GEOG 471	Senior Geography Capstone	3
Four courses	Human Environment Geography Group <i>Choose from: *445, or any GEOG courses numbered in the 360s or 460s</i>	12
Elective	Any GEOG course at the 200- 300- or 400-level	3-4
	<b>Total Credit Hours</b>	<b>38-39</b>

### Bachelor of Science, Geography

The B.S. major in Geography requires 39-43 credit hours of lower and upper-division course work. It is suitable for students interested in careers that require technical skills in mapping and/or spatial analysis. The current curricular structure is shown in the table below, with structural and course-related changes proposed by the GES curriculum committee listed below in the section titled "Potential Revisions: GIScience Courses."

<b>Required curriculum: Bachelor of Science, Geography</b>		<b>Hours</b>
GEOG 101	Home Planet: Land, Water and Life	3
GEOG 105L	Home Planet: Land, Water and Life Laboratory	1
GEOG 102	People and Place	3
GEOG 281	Introduction to Maps and Geospatial Information	3
GEOG 380	Basic Statistics for Geographers	3
GEOG **381L	Introduction to Geographic Information Systems	4
GEOG *481L	Map Design and Geovisualization	4
GEOG 471	Senior Geography Capstone	3
One course	Any GEOG course numbered in the 360s or 460s	3
4 courses	Any GEOG courses at the 200- 300- or 400-level	12-16
	<b>Total</b>	<b>39-43</b>

### Minor in Geographic Information Science (GIScience)

The curriculum for the minor in GIScience requires 19 credit hours of course work. Required Courses include: GEOG281 and \*\*GEOG381L. Four electives can be chosen from the Geographic Information Science Group: GEOG380L, GEOG427, GEOG428, GEOG483L, GEOG484L, GEOG485L, GEOG486L, GEOG487L, GEOG488L. No structural changes are proposed for this program at this time.

### Minor in Geography

The curriculum for the minor in Geography requires 22 credit hours. Required Courses include: GEOG101, GEOG102, GEOG105L. Electives: 15 additional credit hours of Geography course work. Distributed minor not available. No structural changes are proposed for this program at this time.

### Minor in Law, Environment and Geography

The curriculum for the minor in Law, Environment and Geography requires 22 credit hours of course work. Required Courses include: GEOG101, GEOG 102, GEOG 105L and GEOG 364. Four electives chosen from: GEOG 195, GEOG 350, GEOG \*\*360, GEOG 365, GEOG 461, GEOG 462, GEOG 463, GEOG 464. No structural changes are proposed for this program at this time.

### Master of Science in Geography

The M.S. Geography includes two different content-based concentrations (Environmental Studies and Geographic Information Science), which each offer thesis and non-thesis plan options. Regardless of concentration or plan, however, the M.S. Geography is fundamentally oriented around the development and application of research skills. The current curricular structure is shown in the table below, with course-related changes proposed by the GES curriculum committee listed below in the various sections on "Potential Revisions."

The M.S. Plan I option, with concentration in Environmental Studies, requires 24-25 hours of coursework, plus 6 hours of thesis credits.

<b>Plan I</b>	<b>M.S. Geography, Concentration in Environmental Studies</b>	<b>Hours</b>
GEOG 501	History and Methods in Geography	3
GEOG 502	Approaches to Geographic Research	3
GEOG 514 -or- GEOG 515 -or- GEOG 516 -or- GEOG 517	Natural Resources Management Seminar  Cultural and Political Ecology  Seminar: Globalization  Legal Geography	3
	Two additional courses from the Environmental Studies List: *445, 514, 515, 516, 517, 561, 562, 563, 564, 566, 567.	6
	One course from the GIScience List: *481L, 525, 527,528, 580L, 581L, 583L, 584L, 585L, 586L, 587L, 588L.	3-4
	Two elective courses	6
	Thesis	6
	<b>Total Credit Hours</b>	<b>30-31</b>

The M.S. Plan I option, with concentration in Geographic Information Science, requires 24-26 hours of coursework, plus 6 hours of thesis credits.

<b>Plan I</b>	<b>M.S. Geography, Concentration in Geographic Information Science</b>	<b>Hours</b>
GEOG 501	History and Methods in Geography	3
GEOG 502	Approaches to Geographic Research	3
GEOG 525	Advanced GIScience Seminar	3
	Three courses from the GIScience List: *481L, 527,528, 580L, 581L, 583L, 584L, 585L, 586L, 587L, 588L.	9-11
	One course from the Environmental Studies List: *445, 514, 515, 516, 517, 561, 562, 563, 564, 566, 567.	3
	One elective course	3
	Thesis	6
	<b>Total Credit Hours</b>	<b>30-32</b>

The M.S. Plan II option, with concentration in Environmental Studies, requires 30-31 hours of coursework, plus 3 hours of master's project credits.

<b>Plan II</b>	<b>M.S. Geography, Concentration in Environmental Studies</b>	<b>Hours</b>
GEOG 501	History and Methods in Geography	3
GEOG 502	Approaches to Geographic Research	3
GEOG 514 -or- GEOG 515 -or- GEOG 516 -or- GEOG 517	Natural Resources Management Seminar  Cultural and Political Ecology  Seminar: Globalization  Legal Geography	3
	Three additional courses from the Environmental Studies List: *445, 514, 515, 516, 517, 561, 562, 563, 564, 566, 567.	9
	One course from the GIScience List: *481L, 525, 527,528, 580L, 581L, 583L, 584L, 585L, 586L, 587L, 588L	3-4
GEOG 597	Master's Project	3
	Three elective courses	9
	<b>Total Credit Hours</b>	<b>33-34</b>

The M.S. Plan II option, with concentration in Geographic Information Science, requires 30-32 hours of coursework, plus 3 hours of master's project credits.

Plan II	M.S. Geography, Concentration in Geographic Information Science	Hours
GEOG 501	History and Methods in Geography	3
GEOG 502	Approaches to Geographic Research	3
GEOG 525	Advanced GIScience Seminar	3
	Four courses from the GIScience List: *481L, 580L, 581L, 583L, 584L, 585L, 586L, 587L, 588L.	12-14
	Two courses from the Environmental Studies List: *445, 514, 515, 516, 517, 561, 562, 563, 564, 566, 567.	6
GEOG 597	Master's Project	3
	One elective course	3
	<b>Total Credit Hours</b>	<b>33-35</b>

#### Shared-Credit Undergraduate/Graduate Degrees Program

The Department of Geography and Environmental Studies and the Department of Economics offer a Shared-Credit "3/2" Program. The Program enables completion of a B.A. in Economics with one of three minors from Geography and Environmental Studies, and an M.S. in Geography in five total years of study. The curricular requirements are listed below:

Undergraduate Requirements in GES		Hours
GES minor	Students must complete one of the three minors in Geography and Environmental Studies: Minor in Geographic Information Science; Minor in Geography; or Minor in Law, Environment, and Geography	20-22
GEOG 501 And GEOG 502	Taken in the fourth undergraduate year (for undergraduate credit until the undergraduate degree is awarded, and full admission to the graduate portion of the program is granted)	6
elective	One approved graduate course taken during the fourth undergraduate year (for undergraduate credit until the undergraduate degree is awarded, and full admission to the graduate portion of the program is granted)	3-4
Undergraduate Requirements in Economics		Hours
ECON major	Completion of all B.A. requirements for the major in Economics, including all General Education, lower and upper-division, and Economics major course work	
Electives	Completion of at least 12 credit hours of 300- and 400-level course work that is complementary to the M.S. in Geography, including: <ul style="list-style-type: none"> <li>• <b>At least two of the following</b> 400-level courses: ECON *407, ECON *408 or ECON *409, ECON *442, ECON *466</li> <li>• <b>The remaining 6 credit hours</b> may be completed from the following 300-level courses: ECON *341, ECON 342, ECON *343</li> </ul>	12

<b>Graduate Requirements in GES</b>		<b>Hours</b>
Transition	The beginning of undergraduate Year 4 marks the beginning of the time-to-degree for the graduate portion of the program. After the student's undergraduate degree is awarded and full admission to the graduate portion of the program is granted, GEOG 501 and 502, the three credit hours of approved graduate course work from the fourth undergraduate year, and another three credit hours of 400-level electives from the minor are then transferred to the graduate-level transcript towards the M.S. To be transferred to the graduate-level transcript, a 400-level elective must be available for graduate credit or offered as a 400/500-level course.	
	Thesis, to be completed in year 5	6
	12 additional credit hours to be completed in year 5, from either M.S. concentration	12

### Graduate Certificate in Law, Environment, and Geography

The graduate certificate in Law, Environment, and Geography provides students both tools and analytic frames for understanding the spatial and legal dimensions of environmental dynamics and challenges. The current curricular structure is shown in the table below.

<b>Certificate Requirements</b>		<b>Hours</b>
Core	GEOG 517 Legal Geography	3
GES electives	Three courses, chosen from: GEOG 514 Natural Resources Management Seminar GEOG 515 Cultural and Political Ecology GEOG 561 Environmental Management GEOG 562 Water Resources Management GEOG 563 Public Lands Management GEOG 564 Food and Natural Resources	9
Non-GES electives	Two courses, chosen from: AMST 520 T: Environment, Science and Technology AMST 523 Environmentalism of the Poor CRP 515 Natural Resources Field Methods CRP 527 Watershed Management CRP 532 Foundations of Natural Resources ECON 542 Topics in Environmental, Resource, and Ecological Economics ECON 545 Water Resources II - Models ECON 546 Water Resources I - Contemporary Issues HIST 633 U.S. Environmental History HIST 638 American Legal History Before 1877 LAW 547 Water Law LAW 554 Indian Water Law LAW 565 Natural Resources LAW 580 Environmental Law LAW 593 T: Law LAW 635 Land Use Regulation	6
	<b>Total Credit Hours</b>	<b>18</b>

### Potential Revisions: General Education courses

A GES curriculum working group was recently charged with reviewing assessment data and considering potential revisions to these “core course” offerings. Its conclusions and future directions are as follows:

1. While it is useful to finally have some consistent assessment data, consensus was that the overall accuracy, effectiveness, and meaning of that data is simply too unclear at this point to have it influence curriculum or pedagogy. Assessment data needs to be both collected over a longer time and to be evaluated as an aid for pedagogy before integrating it into curricular decisions.
2. Given the breadth of our core courses, the traditional freedom in pedagogy that has been the hallmark of our department, and the different teaching approaches to these courses among different instructors, we are reticent to suggest a unified approach to these courses. There are, however, a variety of potential course improvements that could be generated from the following changes:
  - Create discussion sections for GEOG102 and GEOG140, to enhance student engagement with content in these large-format courses. GEOG101 already benefits from the existence of the GEOG105L lab, although students are not required to take both.
  - Increase TA support for large enrollment offerings (GEOG101, GEOG102, GEOG140), since these course currently present an undue burden on instructors and are therefore compromised in terms of assignment/exam quality.
  - Obtain funding to enhance multimedia support and additional student engagement components for core courses.
  - Teach core courses online every semester, to improve student access.
  - Integrate assessment data into the annual GEOG 105L revision processes.
  - Consider co-teaching more courses in an integrative manner that incorporates human/physical or qualitative/quantitative methods.

### Potential Revisions: Environmental Studies Courses

A GES curriculum working group was recently charged with considering potential revisions to the Environmental Studies course offerings, especially in light of the imminent arrival of Dr. Ben Warner as an Assistant Professor in fall 2017. (The committee did not explicitly consider the imminent arrival of Dr. Ronda Brulotte as Associate Professor or Dr. Lindsay Smith as Assistant Professor in spring 2017, as these transfers were not yet known at the time the committee completed its work.)

For purposes of this conversation, the courses considered as “Environmental Studies” offerings were:

- 180. The World of Beer.
- 195. Introduction to Environmental Studies.
- 217. Energy, Environment and Society.
- 350. Natural Environments.
- 352. Global Climate Change.
- 360. Land Use Management.
- 363. Economic Geography.
- 364. Law, Place and Space.
- 365. Nature and Society.
- 445. Geography of New Mexico and the Southwest.
- 450. Environmental Hazards.
- 461 / 561. Environmental Management.

- 462 / 562. Water Resources Management.
- 463 / 563. Public Land Management.
- 464 / 564. Food and Natural Resources.
- 466 / 566. The City.
- 467 / 567. Governing the Global Environment.
- 514. Natural Resources Management Seminar.
- 515. Cultural and Political Ecology.
- 516. Seminar: Globalization.
- 517. Legal Geography.

The working group's conclusions and future directions are as follows:

1. There was consensus that all the following should be treated as recommendations, with no action taken until they can be presented to the APR reviewers for feedback.
2. Ben Warner will teach the GEOG516 Globalization course in his first year, but this course may be subsequently revised with a development focus, or we will alternately consider adding a new "Environment and Development" course for him.
3. A new course will be created: GEOG469/569 "Peoples and Environments in Latin America."
4. In keeping with the numbering of this new class, we likewise recommend that "Geography of New Mexico and the Southwest" be renumbered and renamed as GEOG468/568 "Peoples and Environments in the New Mexico Southwest."
5. To deal with the perennial problem that we cannot offer all Environmental Studies courses on a regular annual basis, the working group proposed the following:
  - A name change for GEOG462/562 Water Resources Management will be implemented to update the course title but maintain its focus on water. The exact name will be decided after Dr. Warner arrives.
  - GEOG467/567 "Governing the Global Environment" should be renamed to "Governing the Environment" and will cover material currently addressed in the two courses titled GEOG461/561 Environmental Management and GEOG463/563. Public Land Management.
  - Accordingly, GEOG461/561 Environmental Management and GEOG463/563 Public Land Management will be allowed to sunset.
  - Once Dr. Warner arrives, the Environmental Studies faculty will have a conversation about whether to re-structure or even combine GEOG514 Natural Resources Management Seminar and GEOG515 Cultural and Political Ecology. It would be preferable for any resulting course to have a generic name (e.g. "Human-Environment Studies") that allows for different instructors to approach the course with different theory and/or content.
6. The benefits and burdens of 8-week courses, hybrid courses, and online offerings should be considered in the future, to determine whether it makes sense to alter formats for specific Environmental Studies courses.

#### Potential Revisions: GIScience Courses and Curricula

A GES curriculum working group was recently charged with reviewing existing GIS, remote sensing, and quantitative curricula and proposing revisions as needed. The working group concluded that a new system of prerequisites should be created for the GIS track so as to enable students to build on competencies from lower-numbered classes before moving to higher numbered classes. Potential changes are as follows.



#### Degree requirements:

- BS Geography majors should be required to take GEOG281, GEOG\*\*381L and GEOG\*481L, whereas now they have a choice between GEOG\*\*381L and GEOG\*481L. This will potentially increase the total number of credits required for the degree.
- The MS Geography curriculum for the GIScience concentration should maintain the GEOG525 requirement and should additionally add GEOG581L (or equivalent background in an intro GIS course) as a requirement.

#### Pre-requisites:

- If allowable by the official UNM catalog rules, GEOG281 should become a prerequisite for GEOG\*\*381L and GEOG\*481L only if the student is a GEOG major or minor. (Currently, GEOG281 is a pre-req for all students in GEOG\*481L, while GEOG\*\*381L does not have any pre-requisites.) For non-GEOG majors, GEOG281L should be “strongly recommended” but not required as a pre-requisite for GEOG\*\*381L or GEOG\*481L.
- Students should be required to take either GEOG\*\*381L or GEOG581L as a gateway pre-requisite before enrolling in any of the 400/500 level GIScience courses. This pre-requisite would be waived only by permission of instructor.

#### Course content:

- The entire GIS/RS/Quantitative curriculum was considered, and the content and role of the following courses are suggested for refinement and/or redefinition as below:
- GEOG 522 Spatial Data Management is currently going through the curriculum approval process to be cross-listed as a regular offering in GES. (It is already a regular offering in the Organization, Information, and Learning Sciences (OILS) program.)
- GEOG 525 Advanced GIScience Seminar should be comprehensive survey course of research in GIScience to ensure that M.S. Geography students in the GIScience track graduate with a broad base understanding of the breadth of GIScience.
- GEOG 486L/586L Applications in GIS (name to be changed from Applications of GIS) should delve into various applications of GIScience, e.g., health, hazards, water, food, etc.
- GEOG 487L/587L Spatial Modeling in GIScience (name to be changed from Spatial Analysis & Modeling) should cover spatial models and modeling in GIScience, e.g., spatial interpolation, hydrologic, distance/cost, network, diffusion, agent based, and cartographic models)
- GEOG 488L/588L Advanced Topics in GIScience (name to be changed from GIS Concepts & Techniques) should cover advanced topics in GIScience, with specific content determined by individual instructors. In a sense this will serve as a special topics course.
- GEOG 580L Spatial Statistics should cover spatial statistics, e.g., point pattern analysis, spatial autocorrelation, etc.
- GEOG 581L Introduction to GIS for Graduate Students. The working group discussed the possibility of merging GEOG\*\*381L and GEOG581L into one course. After some discussion and feedback from other GIScience faculty, we recommend that GEOG581L remain in the curriculum as a separate course. The reasons for this include:
  - Both courses provide a basic introduction to GIS, consisting of three major parts: theories in GIScience, labs, and class projects. However, GEOG\*\*381L focuses on theories and labs, while GEOG581L focuses on theories and projects, with emphasis on application of techniques to students’ own projects. These differences are appropriate.

- GEOG\*\*381L regularly fills up, and there would not be room to accommodate students from 581L without adding another lab section.
- Stacking a 500 level course that is 3 credits on top of a 300 level course that is 4 credits could be problematic.

Course structure:

The working group proposed creating defined content groupings within a more transparent and pre-requisite-driven curricular structure as shown below:



**2A (reflection question): Which skills that are outlined in the new NM HED Core structure would the unit's undergraduate curriculum align with and target? Explain what innovative practices could be implemented to ensure students are able to better achieve these skills? (Relevant data can be accessed at: the attached Draft Student Core Curriculum Checklist and Proposed Model for NM Gen Ed Critical Thinking Learning Outcomes)**

As a preliminary matter, it is very unclear whether the NM HED model for General Education (GenEd) structure anticipates that individual classes are supposed to cover every aspect of one or more given Essential skills. And because many of these essential skills are so broad and so detailed in their current form, it appears that classes will have to be designed from the ground up to cover every aspect of the proposed skills. Moreover, the NM GenEd structure is still in draft form, and thus very much in flux, so it is difficult to address this question with confidence.

That said, assuming that the final GenEd structure somewhat resembles the current draft, and that courses may fit within that structure by addressing a substantial part – if not all – of one or more “essential skills,” it appears that a number of lower-level GES courses would align with that emerging structure. We discuss each of the “essential skills” (or subcomponents thereof) outlined in the most recently available draft, and discuss in turn which of our lower-level curricular offerings address these skills, or—with the implementation of innovative practices – could be potentially made to help students achieve these skills. Please note that many upper-level courses in GES would clearly contribute to the development of essential skills, but we have chosen to focus only on lower-level courses here, in keeping with the norm at UNM that only 100- and 200-level courses are counted toward the general education core.

Essential Skill: Written and Spoken Communication

Three of the GES 100-level courses are ideally suited for developing students' written and spoken communication skills:

- GEOG 102 People and Place [Human Geography]
- GEOG 140 Introduction to World Regions [World Regional Geography] and
- GEOG 195 Introduction to Environmental Studies

While none of these courses are focused exclusively on the development of oral and written communication skills, each has been taught in a way that centers these skills. At this point, it is possible to enhance the extent to which these offerings directly focus on the development of communicative scale by adding Teaching Assistant support focused on written and oral work to both deepen thematic, empirical, and theoretical learning through TA facilitated written and oral projects.

Essential Skill: Quantitative Skills

At the lower level, three GES courses are ideally suited for developing students' quantitative skills:

- GEOG 101 Home Planet
- GEOG 105L Home Planet Lab
- GEOG 281 Introduction to Maps and Geospatial Information

All of these courses provide innovative and engaging ways to teach students the quantitative competencies encompassed by this General Education skill.

<b>Quantitative Sub-Skills</b>	<b>GEOG 101</b>	<b>GEOG 105L</b>	<b>GEOG 281</b>
Computational Skills	X	X	X
Communication of Quantitative Arguments		X	X
Analysis of Quantitative Arguments	X	X	X
Formulation of Quantitative Arguments	X	X	X
Mathematical process		X	X
Quantitative models		X	X

### Essential Skill: Critical Thinking

A number of lower-level GES courses are ideally suited for developing critical thinking skills, namely:

- GEOG 101 Home Planet
- GEOG 105L Home Planet Lab
- GEOG 102 People and Place [Human Geography]
- GEOG 140 Introduction to World Regions [World Regional Geography] and
- GEOG 195 Introduction to Environmental Studies.
- GEOG 217 Energy, Environment and Society

While none of these courses are focused exclusively on the development of critical thinking skills, each has been taught in a way that centers these skills, and could be further developed to center student achievement in these areas:

<b>Critical Thinking Sub-Skill</b>	<b>GEOG 101</b>	<b>GEOG 105L</b>	<b>GEOG 102</b>	<b>GEOG 140</b>	<b>GEOG 195</b>	<b>GEOG 217</b>
Identifying Arguments	X	X	X	X	X	X
Dissecting Arguments	X		X	X	X	X
Assessing the logical cogency of arguments	X		X	X	X	
Assessing the acceptability of premises		X			X	X
Identifying common fallacies	X			X	X	X
Assessing definitions and concepts for acceptability		X			X	
Producing Dialectical Arguments			X	X	X	X
Evaluation & Interpretation		X	X	X		
Production and Support of Arguments			X	X		
Problem solving	X	X	X	X		X

### Essential Skill: Personal and Social Responsibility

Because most GES lower-level offerings are grounded in contemporary trends and crises, the skills of personal and social responsibility are inherently a core component of each. Below, we list each of the courses that most closely track the sub-components of this essential skill:

<b>Personal and Social Responsibility Sub-Skills</b>	<b>GEOG 101</b>	<b>GEOG 102</b>	<b>GEOG 105</b>	<b>GEOG 140</b>	<b>GEOG 195</b>	<b>GEOG 217</b>	<b>GEOG 281</b>
Intercultural reasoning		X		X		X	
Intercultural competence							
Ethical reasoning							
Civic knowledge and engagement		X		X	X	X	
Collaboration skills	X	X	X	X	X	X	X
Foundations and skills for lifelong learning	X	X	X	X	X	X	X

**Essential Skill: Information Literacy Requirement**

While this skill set appears to be very much in flux at this time, its breadth as currently stated would appear to preclude any course not specifically designed around the 21 “component” skills so far listed to fully cover this essential skill. That said, a critical and probing take on the creation, situatedness, and use of information is common to all of the human geography offerings at the 100 and 200 levels, including GEOG101, GEOG102, GEOG105L, GEOG140, GEOG195, and GEOG217.

The additional digital literacy outcomes outlined so far are directly addressed by GEOG 281 (Introduction to Maps and Geospatial Information) which combines a robust application of IT concepts, use of digital devices, exploration of privacy and security concerns, and basic information literacy outcomes.

**2B. Describe the contributions of the unit to other internal units within UNM, such as offering general education core courses for undergraduate students, common courses for selected graduate programs, courses that fulfill pre-requisites of other programs, cross-listed courses.**

GES currently has five courses in the General Education core for undergraduate students:

- GEOG101 Home Planet – Natural Sciences
- GEOG102 People and Place – Social Sciences
- GEOG105L Home Planet Lab – Natural Sciences Lab
- GEOG140 Introduction to World Regions – Humanities
- GEOG217 Energy, Environment and Society –

As listed above in Criterion 1, GES courses are also included in a variety of other departments’ curricula:

- **Department of American Studies** – includes Geographic Studies as one of six areas in which undergraduate students may take “Interdepartmental Studies of American Culture”
- **Community and Regional Planning Program** – includes three GEOG courses as “physical world” electives within the Bachelor of Arts in Environmental Planning and Design
- **Department of Earth and Planetary Sciences** – includes 3 GES courses as electives in the “Spatial Analysis” track for the Environmental Science B.S. degree
- **Department of Economics** – has worked with us to develop a collaboratively offered “3/2” shared-credit program in which students earn a BA in Economics and an MS in Geography just five years.

- **College of Education** – includes multiple GEOG courses as either requirements or electives for its undergraduate degree program concentrations in Social Studies and in Secondary Education.
- **School of Engineering** – has worked with us to standardize a cross-listed offering of ME217/GEOG217 “Energy, Environment, and Society”
- **Water Resources Program** – includes GEOG courses as electives, and has discussed the possibility of standardizing a grad-level offering of our Water Resources Management course.

**2C. Describe the modes of delivery used for teaching courses.**

The following tables show teaching formats in GES, both those used historically (marked with an X) and those currently under consideration (marked with an asterisk).

**Undergraduate course formats**

	Trad'l Lecture	Active/Peer Learning	Lab / Discussion	Seminar	Field/ Experiential	Hybrid Lect/ONL	Online only
GEOG101 Home Planet	X	X	*			*	X
GEOG102 People & Place	X		*			*	X
GEOG105L Home Planet Lab			X				
GEOG140 Intro World Regions	X	X	*			*	X
GEOG180 World of Beer	X						
GEOG195 Intro Env Studies	X				*	X	X
GEOG217 Energy, Envt, Society	X						
GEOG251 Meteorology (by EPS)	X						
GEOG281 Maps & Spatial Info	X					X	*
GEOG350 Natural Environments	X				X		
GEOG352 Global Climate Chg (EPS)	X						
GEOG360 Land Use Mgmt	X						
GEOG363 Economic Geog	X						
GEOG364 Law, Place & Space	X				X		
GEOG365 Nature & Society		X		X			
GEOG380 Basic Stats for Geog	X		X				
GEOG381L Intro GIS	X		X				
GEOG427 Intro Programming GIS	X		X				
GEOG428 Adv Programming GIS	X		X				
GEOG445 Geog of NM and the SW	X	X			X		
GEOG450 Environmental Hazards	X						
GEOG461 Enviro Management	X					*	X
GEOG462 Water Resource Mgmt	X						
GEOG463 Public Lands Mgmt	X						
GEOG464 Food and Nat Resources	X	X					
GEOG466 The City	X			X	X		
GEOG467 Governing Global Envt	X						
GEOG471 Senior Capstone		X		X			
GEOG481L Map Design & Geovis	X		X				
GEOG483 Remote Sensing Fundam	X		X				
GEOG484 Applic Remote Sensing	X		X				
GEOG485 Internet Mapping						X	
GEOG486 Applications of GIS	X		X				
GEOG487 Spatial Anal & Modeling	X		X				
GEOG488 GIS Concepts & Tech	X						

### Graduate course formats

	Trad'l Lecture	Active/Peer Learning	Lab / Discussion	Seminar	Field/ Experiential	Hybrid Lect/ONL	Online only
GEOG501 Geog Hist Methods				X			
GEOG502 Approaches Geog Rsch				X			
GEOG514 Natural Resources				X			
GEOG515 Cult/Pol Ecology				X			
GEOG516 Globalization				X			
GEOG517 Legal Geography				X			
GEOG524 Adv Topics Remote Sens			X	X			
GEOG525 Adv Seminar GIScience			X	X			
GEOG527 Intro Programming GIS	X		X				
GEOG528 Adv Programming GIS	X		X				
GEOG561 Enviro Management	X					*	X
GEOG562 Water Resource Mgmt	X						
GEOG563 Public Lands Mgmt	X						
GEOG564 Food and Nat Resources	X	X					
GEOG566 The City	X			X	X		
GEOG567 Governing Global Envt	X						
GEOG580 Spatial Stats	X		X				
GEOG581 Intro GIS Grad Students	X		X				
GEOG583 Remote Sensing Fundam	X		X				
GEOG584 Applic Remote Sensing	X		X				
GEOG585 Internet Mapping						X	
GEOG586 Applications of GIS	X		X				
GEOG587 Spatial Anal & Modeling	X		X				
GEOG588 GIS Concepts & Tech	X						

As described above (in the “Potential Revisions” sections of 2A), the GES curriculum committee is considering whether to experiment with a wider variety of course formats, especially for 100-level General Education courses and for Environmental Studies courses. UNM students seem particularly eager to take online and hybrid courses, as well as compressed (e.g. 8-week) offerings. GES would like to evaluate the pedagogical options, costs, and benefits of these formats, while also working to provide more experiential learning opportunities for students.

## Criterion 3. Teaching and Learning: Continuous Improvement

*The unit should demonstrate that it assesses student learning and uses assessment to make program improvements. In this section, the unit should reference and provide evidence of the program's assessment plan(s) and annual program assessment records/reports. (Differentiate for each undergraduate and graduate degree/certificate program and concentration offered by the unit.)*

### **3A. Describe the assessment process and evaluation of student learning outcomes for each program by addressing the questions below.**

- **What are the student learning outcomes for the program?**
- **How have the student learning outcomes been changed or improved?**
- **How are the student learning outcomes clearly defined and measurable?**
- **How are the student learning outcomes communicated to faculty and students?**
- **What current direct and indirect assessment methods are used to evaluate the extent to which students are meeting the student learning outcomes?**
- **How have the program's assessment methods been changed or improved?**

As we described in Section 1C, the department's three degree programs share the same five broad learning goals. The different foci and educational levels of the programs are reflected in different student learning outcomes, measuring instruments, and measuring processes for each program. These are described below, for each degree program.

#### Program Goals and Student Learning Outcomes for the Bachelor of Science Degree Program

##### Goal A: Spatial Reasoning:

*Students will develop an ability to see meaning in the arrangement of things in space.*

SLO A1 Students will be able to locate major physical and human geographic features on a world map.

SLO A2 Students will be able to interpret geographic patterns using core geographic concepts.

##### Goal B: Research Practice:

*Students will become geographical problem-solvers capable of using qualitative, quantitative and/or spatial methods of research appropriate to their level of training.*

SLO B1 Students will be able to identify the geographic contexts relevant to an inquiry.

SLO B2 Students will be able to acquire and manipulate data relevant to a geographic inquiry.

SLO B3 Students will be able to assess the results of a data-driven geographical inquiry.

##### Goal C: Geospatial Tools:

*Students will develop an ability to use standard geospatial analysis tools to address relevant problems.*

SLO C1 Students will be able to identify, collect and process digital spatial data using industry-standard tools.

SLO C2 Students will be able to employ appropriate geospatial analysis methods and interpret the results.

##### Goal D: Communication Skills:

*Students will become clear and effective communicators.*

SLO D1 Students will be able to communicate clearly and effectively in an oral format.

SLO D2 Students will be able to communicate clearly and effectively in a written format.

SLO D3 Students will be able to communicate clearly and effectively with geovisualization methods.



Goal E: Professional Development:

*Students will gain preparedness for professional careers in geography and allied fields.*

SLO E1 Students will be able to prepare an acceptable, entry-level professional résumé.

Program Goals and Student Learning Outcomes for the Bachelor of Arts Degree Program

Goal A: Spatial Reasoning:

*Students will develop an ability to see meaning in the arrangement of things in space.*

SLO A1 Students will be able to locate major physical and human geographic features on a world map.

SLO A2 Students will be able to interpret geographic patterns using core geographic concepts.

Goal B: Research Practice:

*Students will become geographical problem-solvers capable of using qualitative, quantitative and/or spatial methods of research appropriate to their level of training.*

SLO B1 Students will be able to identify the geographic contexts relevant to an inquiry.

SLO B2 Students will be able to acquire and manipulate data relevant to a geographic inquiry.

SLO B3 Students will be able to assess the results of a data-driven geographical inquiry.

Goal C: Relational Understanding:

*Students will develop an ability to see meaningful relationships between people, places, and the environment.*

SLO C1 Students will be able to analyze human-environment interaction(s) for a specific case and for specified social and/or environmental conditions.

SLO C2 Students will be able to recognize spatial meanings of social and cultural processes.

Goal D: Communication Skills:

*Students will become clear and effective communicators.*

SLO D1 Students will be able to communicate clearly and effectively in an oral format.

SLO D2 Students will be able to communicate clearly and effectively in a written format.

SLO D3 Students will be able to communicate clearly and effectively with geovisualization methods, including map composition.

Goal E: Professional Development:

*Students will gain preparedness for professional careers in geography and allied fields.*

SLO E1 Students will be able to prepare an acceptable, entry-level professional résumé.

Because the student learning outcomes related to goals A, B, D, and E, are the same for both the B.S. and B.A. programs, they are measured in the same way, without differentiating the two groups of students. All undergraduate Geography and Environmental Studies majors are required to take the capstone course, GEOG 471. All of the common SLOs are measured in this course. SLOs related to goals A and B are measured using a test administered in GEOG 471. The test comprises of a set of standard questions (See Appendix B). Each SLO is measured by a specific set of questions as described in the table below. The performance benchmark is that 75% of students should achieve acceptable marks (correct or partially correct answers) for each SLO.

## Student Learning Outcomes Assessed with the GEOG471 Instrument (Appendix B)

Student Learning Outcome	Relevant Questions
A.1. Students will be able to locate major physical and human geographic features on a world map.	14, 15, 16, 17
A.2. Students will be able to interpret geographic patterns using core geographic concepts.	1, 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h, 3a, 3b, 3c, 3d, 3e
B.1. Students will be able to identify the geographic contexts relevant to an inquiry.	4a, 4b, 4c, 5, 9a, 9b, 9c, 9d, 13a, 13b, 13c, 13d, 13e
B.2. Students will be able to acquire and manipulate data relevant to geographic inquiry.	6, 7, 8, 11, 12
B.3. Students will be able to assess the results of a data-driven geographic inquiry.	10a, 10b, 10c, 10d, 10e

SLOs related to goal D are measured through a project, completed in this course, with both written and oral components. The SLO related to goal E is measured through a written course assignment: preparation of a professional résumé. The assignments are evaluated using standard rubrics (provided in Appendix C). The assignments, as well as the test described above, are part of the regular grade structure of the course.

For B.S. students, assessment of the SLOs related to goal C is based on the students' final projects in GEOG 381L. This course is focused on the hands-on use of spatial-analytical techniques as applied to a topic of the student's choice. As part of this course, students need to identify, collect, process, analyze, and present digital spatial data relevant to the topic they have chosen. Results of this project are presented in a designed map. This research assignment is embedded in the regular grade structure of GEOG 381L to provide a standard performance incentive. For B.A. students, assessment of these SLOs is based on an assignment (research paper or project) that they have to complete in one of the following courses: GEOG 461, 462, 463, 464, 466, or 467. At least three of these courses are required of all B.A. students. For purposes of Learning Outcomes Assessment, these assignments are evaluated using standard rubrics (provided in Appendix C).

### Program Goals and Student Learning Outcomes for the Master of Science Degree Program

Goal A: Spatial Reasoning:

*Students will develop an ability to see meaning in the arrangement of things in space.*

SLO A1 Students will be able to state an original research question appropriate for geographic analysis.

SLO A2 Students will be able to state how a research project contributes to an existing body of geographic literature.

Goal B: Research Practice:

*Students will become geographical problem-solvers capable of using qualitative, quantitative and/or spatial methods of research appropriate to their level of training.*

SLO B1 Students will be able to design legitimate and appropriate geographic methodology.

SLO B2 Students will be able to implement legitimate and appropriate geographic methodology.

SLO B3 Students will be able to explain and assess the results of original geographic research.

Goal C: Relational Understanding:

*Students will develop an ability to see meaningful relationships between people, places, and the environment.*

SLO C1 Students will be able to collect, process, and present digital spatial data using industry-standard tools. [For students in the GIS specialization program track].

SLO C2 Students will be able to analyze human-environment interaction(s) for a specific case and for specified social and/or environmental conditions. [For students in the Environmental Management specialization program track].

Goal D: Communication Skills:

*Students will become clear and effective communicators.*

SLO D1 Students will be able to communicate clearly and effectively in a written format.

SLO D2 Students will be able to communicate clearly and effectively in an oral format.

SLO D3 Students will be able to communicate clearly and effectively with geovisualization methods, including map composition.

Goal E: Professional Development:

*Students will gain preparedness for professional careers in geography and allied fields.*

SLO E1 Students will be able to enter professional positions or Ph.D. programs related to geography or environmental studies.

For the M.S. degree program, learning outcomes related to goals A, B, C, and D are assessed using each M.S. student's culminating written document and related oral examination as evidence of learning. There are two degree plans for the M.S. in the department: students completing Plan I write a Master's thesis, while students completing Plan II write a professional project report. All students are required to defend their written work in an oral presentation. The thesis or project report and the oral defense are evaluated using a standard rubric (provided in Appendix D). The program performance target for these goals is that all graduating students shall achieve a "satisfactory" or better level for each goal. A student's score for each goal is a composite of his or her score for each SLO related to that goal.

The outcome for goal E is, by necessity, measured after students' completion of the M.S. degree program. Assessment of this outcome is based on self-reported evidence of job placement after graduation. This information is collected by each student's major faculty advisor and compiled by the Assessment Coordinator on an annual basis. This is an indirect measure of progress toward this program goal. The program performance target for this goal is that 75% of our former graduate students will hold a professional position or will be enrolled in a Ph.D. program related to geography or environmental studies within two years of graduation.

Coordination of the learning outcomes assessment process is the responsibility of the departmental Assessment Coordinator. This is a departmental service position held by a regular faculty member for a minimum of one year. The Assessment Coordinator is responsible for communicating the learning objectives, student learning outcomes, and relevant data collection instruments (tests and rubrics) and methods to the instructors of courses in which assessment data is collected. The course instructors are responsible for scoring quizzes and completing assessment rubrics and for supplying these to the Coordinator. These data are compiled by the Coordinator, who produces an annual report. This report is distributed to the faculty and student representatives and subsequently is discussed in a departmental meeting. The Assessment Coordinator is also responsible for identifying important results of the assessment and proposing possible modifications to the instruments and/or methods. If such modifications are proposed, they are also discussed at

the departmental meeting along with the annual report. The report and any modifications to the assessment process are approved by consensus of the faculty and student representatives.

The final, approved version of the report is distributed to any part-time instructors who do not participate in department meetings. It is also made available to students by posting an announcement in a public location in the department, at the same location where SLOs are also posted.

The department of Geography and Environmental Studies developed its first comprehensive program assessment plans during the 2007-08 academic year (at that time, the department name was Department of Geography). The broad learning goals and specific learning outcomes for each goal are listed in Appendix E. These plans were followed through the 2012-13 academic year. For the B.S. and B.A. degree programs, all data were collected in the capstone course, GEOG 471, through the assessment of student responses to several assignments: a scenario illustrating a specific spatial pattern, a case study, and a senior research project with both written and oral final presentation components. This process proved to be too cumbersome to administer and not conducive to measuring certain SLOs accurately. It was revised substantially during the 2012-13 academic year. The current process is the result of that revision. The M.S. assessment plan developed in 2007-08, was very similar to the current process. All data was collected in the same way as it is now collected. It was changed only slightly during the program assessment revision that took place in 2012-13 in order to refine the program's learning goals and SLOs.

Since 2013, the department has also had to modify slightly the program assessment process as a response to changes in reporting requirements implemented by the College of Arts and Sciences and Academic Affairs. These changes primarily concerned the timing of data collection and report generation.

### **3B. Synthesize the impact of the program's annual assessment activities by addressing the questions below.**

- **How have the results of the program's assessment activities been used to support quality teaching and learning?**
- **How have the results of the program's assessment activities been used for program improvement?**
- **Overall, how is the program engaged in a coherent process of continuous curricular and program improvement?**
- **How does the program monitor the effects of changes?**

Geography and Environmental Studies, adhering to UNM requirements on program assessment, has, thus far, followed a three-year cycle on reporting. While data is collected and discussed annually, a complete set of all measures has been reviewed and a comprehensive report has been produced every three years. Because all three degree programs are relatively small, and program outcomes for a particular graduating class can be disproportionately impacted by the performance of one or two individuals, the multi-annual cycle for full analysis also makes sense because it enhances the validity and reliability of the measures. The down-side of this, of course, is that it takes us a longer time to detect any trends in student learning outcomes.

Despite having only completed two full cycles of analysis between 2009 and today, the department did identify some specific areas in which action was necessary to improve teaching and learning. In the undergraduate degree programs, the assessment outcomes led the department to work more closely with the instructors of 100-level courses, especially those who are part-time

instructors, to make them aware of areas in which student learning outcomes indicated that improvements and increased emphasis were needed. For example, while results indicated that students had no problem identifying and locating major physical geographic features such as continents and oceans, they had more difficulty locating human-determined features such as vernacular regions and important lines of latitude. In addition, students had some difficulty abstracting and modeling geographical features and patterns. As a result, instructional changes were implemented in the 100-level courses in human and physical geography. For the Master of Science degree program, the student learning outcomes assessment motivated changes in the courses of the core sequence: GEOG 501 and 502.

The program assessment findings also motivated programmatic changes, directed to both improve student learning and streamline and facilitate progress toward graduation. These changes include the elimination of the 481L/581L (combined undergraduate/graduate) statistics course and its replacement with a more basic 381L statistical methods introduction, and a graduate-level 581L course. The undergraduate course was also made a requirement for the B.S. degree. Also, in part as a result of prior assessment results and in part as a result of the department's efforts to reduce credit hour requirements and streamline the students' path to graduation, the department sought curricular revisions in AY 2014-15. These were approved by the appropriate University bodies and put in place in AY 2015-16. The revisions include degree requirement changes as well as new courses.

As we have already discussed, the department's process for collecting, analyzing, and deliberating upon student learning outcome data is continuous. Both students and faculty participate actively in discussing the results of the program assessment process and proposing improvements on course delivery, the curriculum, and the degree programs. The on-going monitoring of student learning outcomes is also the basis for monitoring the effects of changes.

## Criterion 4. Students (Undergraduate and Graduate)

*The unit should have appropriate structures in place to recruit, retain, and graduate students. (Differentiate by program where appropriate.)*

### **4A. Provide information regarding student recruitment and admissions (including transfer articulation).**

#### Undergraduate programs

Over the last decade, the GES faculty size has grown from extremely small (4) to moderately sized (11). As a result, we have not been able to provide consistent faculty staffing for the position of Undergraduate Director. The role has been filled by a variety of faculty members with limited available service time, including an Assistant Professor and a half-time Lecturer. Despite this limitation, GES has been worked to institute some basic recruitment activities for undergraduate students, including:

- Open houses for undeclared majors who expressed an interest in geography, as well as newly declared geography majors.
- Establishment of an articulation agreement with Central New Mexico College (CNM), a two-year college adjacent to and south of UNM. The articulation agreement enables students in CNM's two-year program in geographic information technologies to transfer into UNM, receiving credit for 3 of our GIScience courses.
- GES is now considering an articulation agreement with Southwestern Indian Polytechnic Institute (SIPI), another 2 year college, to ease the transfer of their students into our B.S. Geography program.

In terms of admissions, requirements are fairly minimal, as GES has tried to eliminate barriers that would make it hard for undeclared students to declare Geography as a major.

#### Graduate program

Over the last decade, GES has invested tremendous energy into improving the M.S. Geography program. This includes substantial development of recruitment activities designed to increase the number and quality of applicants, including:

- Sustained faculty attendance at the AAG (national) and SWAAG (regional) conferences, with an extra subsidy provided in recent years for the Graduate Directors' SWAAG travel to ensure participation in the annual Graduate Programs Information Session.
- Development of a brochure distributed at conferences and annual outreach activities, e.g. Geography Awareness Week.
- Leverage of OGS funds to fly top-ranked applicants to Albuquerque for a "recruitment weekend" where they can meet with faculty and current students.
- Strategic focus on prospective students by the faculty Graduate Director, with a priority placed on responsiveness and personal attention.
- Increased funding for GES students to attend conferences where they present research, thus improving the department's visibility both regionally and nationally.

Admissions standards have also been clarified, with GRE scores added as a requirement. Over the decade, we have seen a substantial increase in applicant quality and preparation.

**4A (reflection question). Data indicate that there is a high number of female faculty associated with your unit. How might the unit use this as leverage to grow the number of female students who major in Geography?**

In Fall 2016, GES had four female faculty (two Assistant and two Associate Professors) and seven male faculty (one Assistant, three Associate, and one full Professor; one Lecturer; and one Visiting Associate Professor).

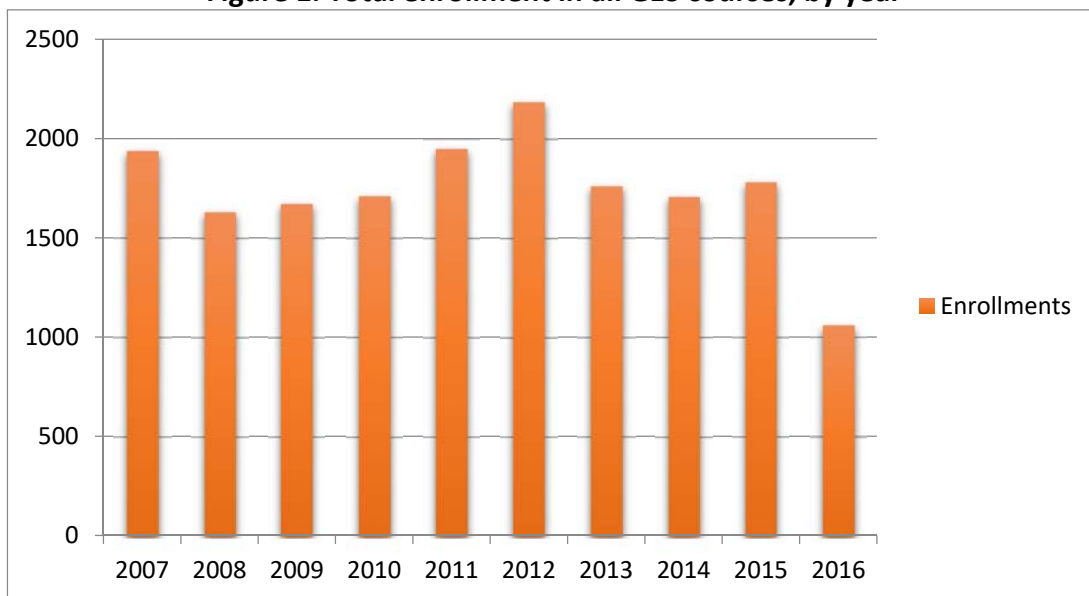
This is not actually “a high number of female faculty,” considering that the discipline of Geography has fairly even gender balance among its PhD student ranks. Beginning in spring 2017, however, GES will have improved gender parity (6 males and 6 females) due to the retirement of our male Lecturer and the addition of two female faculty transferring from Anthropology. We have not yet considered developing a gender-specific recruitment program, but our strategic plan calls for development of a broad diversity plan that would include attention to a variety of minority groups.

**4B. Provide an analysis of enrollment trends, persistence, and graduation trends.**

Overall enrollments

In the last decade, total annual enrollment in GES courses has ranged from a low of 1,631 in 2008 to a high of 2,186 in 2012 (see Figure 1).

**Figure 1. Total enrollment in all GES courses, by year**



*Note: 2016 includes only spring and summer enrollments, only one half of the year.*

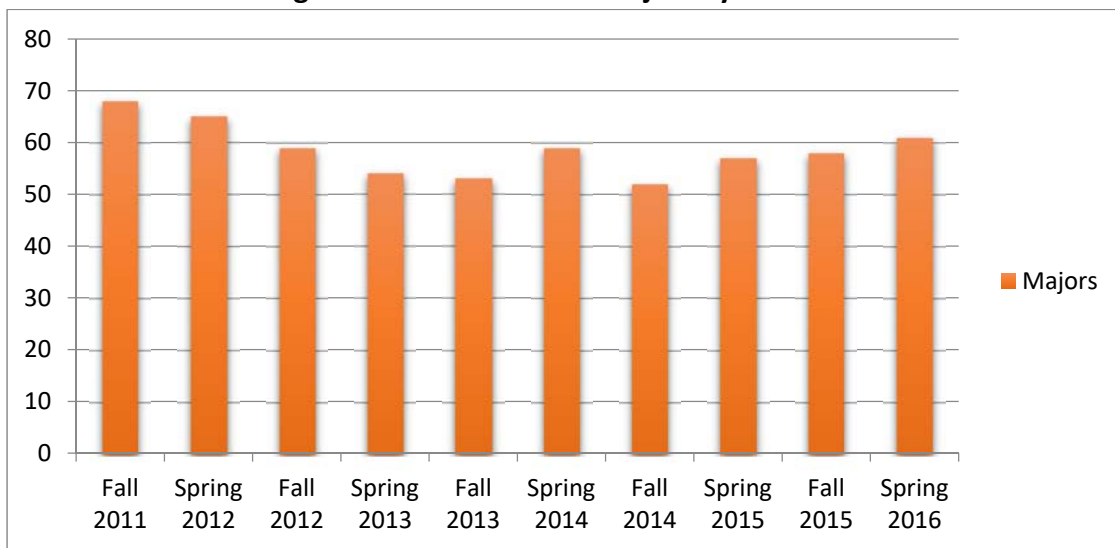
Enrollment trends tend to follow the total number of course offerings, which has increased as the size of the GES tenure track faculty has grown since 2008. The drop-off between 2012 and 2015, however, bucks this trend and tracks closely with declining enrollments in GEOG101, which was historically our largest course. When it became evident that GEOG101 enrollments had dropped from averages of ~275 to averages of ~120, we undertook a comprehensive assessment of all GES enrollments in 2015. It was determined at that time that GEOG101 enrollments were likely impacted by the rising quality and popularity of the EPS101 “Blue Planet” course, which was offered in multiple formats and with extensive TA support. This was slightly offset in 2015 by enrollment growth in GEOG140.

In order to give GES courses the best possible chance for healthy enrollments, we decided in 2015 to update course titles for multiple offerings. In general, we tried to focus on simple and descriptive titles that would provide useful information to students who might not already know what the discipline of Geography offered. In many cases, this involved removing the word “Geography” from course titles, e.g. replacing “Human Geography” with “People and Place” for the title of GEOG102. This renaming effort extended to graduate courses as well, to ensure that non-Geography students from other graduate programs would have better insight into course topics.

Undergraduate programs

The total number of GES majors has remained fairly steady between 50 and 60 over the last five years, with some variation by semester, as shown in the figure below.

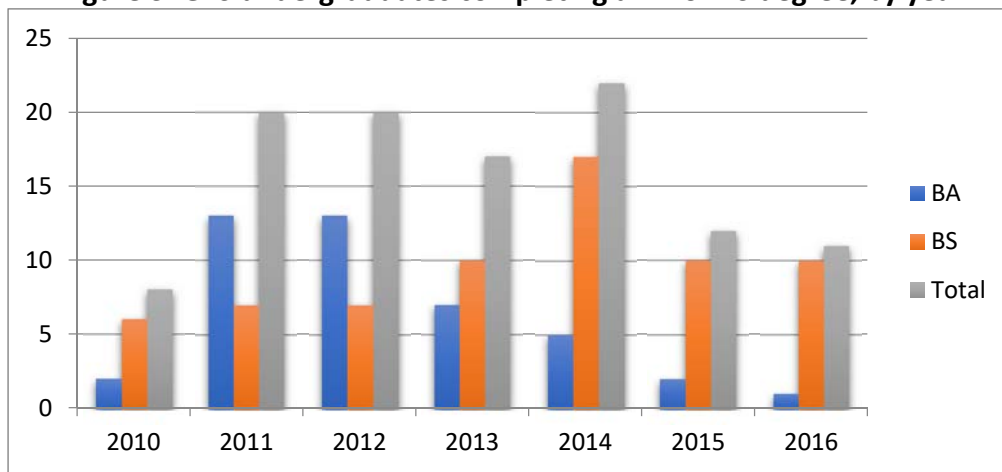
**Figure 2. Number of GES majors by semester**



*Note: UNM’s Office of Institutional Analytics provides data on majors by semester, not by year*

The numbers of GES graduates for each year is illustrated below, broken down by degree.

**Figure 3. GES undergraduates completing a BA or BS degree, by year**



*Note: 2016 includes only spring and summer graduations but already nearly matches the annual total for 2015.*

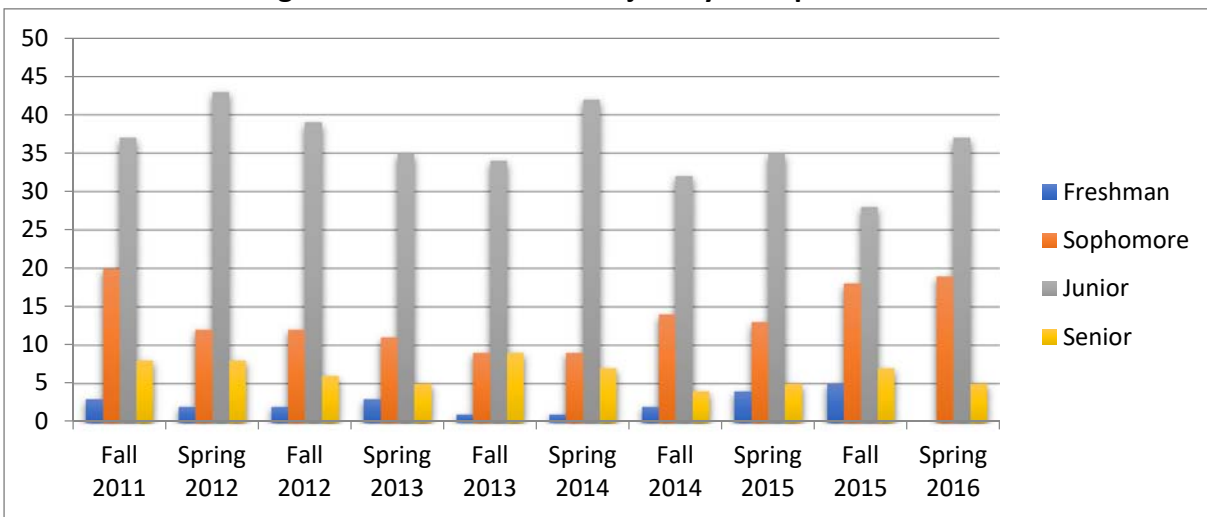


As shown in Figure 3 above, the last five years have seen a steady drop in the number of BA Geography graduates and an increase in the number of BS Geography graduates. This follows a concerted effort to increase the visibility of our GIScience curriculum, and we anticipate continued growth in the GIScience program with the recent addition of several tenure-track GIScience faculty (in 2012, 2014, and 2016).

Figure 3 also shows a significant drop in total Geography degrees awarded in 2015. This is possibly due to three GES faculty leaving UNM in 2013 (two retirements and one extended leave before resignation) and thus diminishing our recruitment capacity at the undergraduate level. If this is indeed the cause, we can expect increased majors/graduations now that we have replaced these losses with three new GIScience faculty (and we have indeed already noted growth in the number of majors). Another possible cause is that we have devoted intense focus to the M.S. Geography program in the last five years, with less attention given to undergraduate recruitment and retention efforts. With the M.S. Geography program now stabilized and vastly improved, our strategic plan calls for turning attention to the undergraduate programs in a similarly sustained way.

A look at our majors by class (Figure 4 below) shows that students typically realize they are interested in Geography at the end of the sophomore or beginning of the junior year. This creates a complex recruitment challenge, as students who have already progressed to junior status have likely already declared another major and completed some of its requirements, creating a disincentive to switch majors (i.e. the need to invest additional time and money to complete additional credit hours). As described above, we have already begun to rename courses so that students can “find Geography” earlier in their UNM careers, but there is likely much more we can do with direct recruiting initiatives.

**Figure 4. Number of GES majors by class per semester**

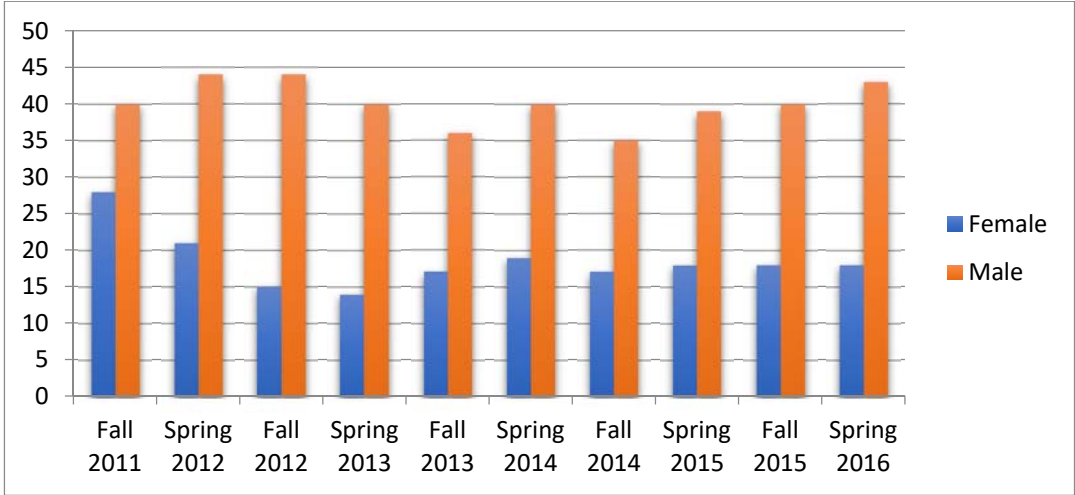


*Note: As above, the OIA provides data on majors by semester, not by year*

And finally, a look at the number of GES majors by gender (Figure 5) and by ethnicity (Figure 6) indicates that we are right to move forward with development of a diversity plan, as called for in our strategic plan. Although our race/ethnic breakdown is similar to that of the overall UNM student body (in that the top three race/ethnic categories in GES are white, Hispanic, and American Indian),

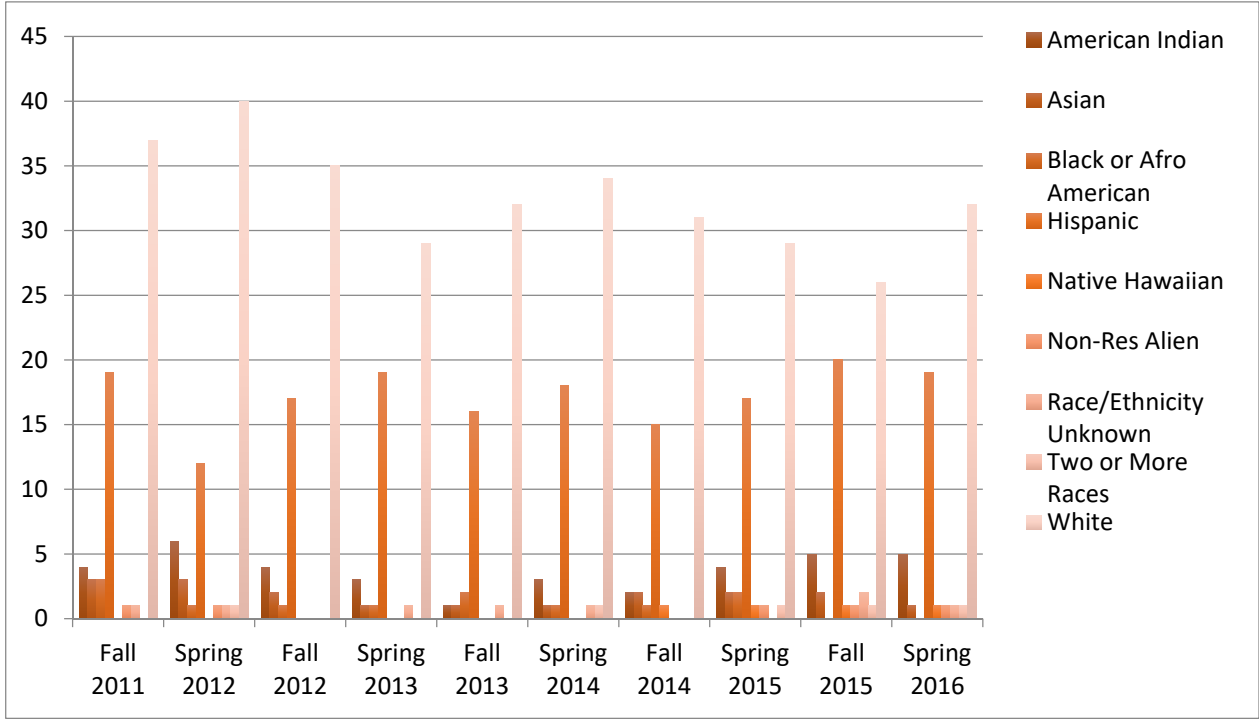
the ratios in GES are skewed significantly toward White students, whereas overall UNM enrollment is 42% Hispanic and 36% White. In addition, GES has about twice as many male as female majors. The development and implementation of a diversity plan will necessarily consider the impacts of these imbalances and strategies to address them.

**Figure 5. GES majors by Gender**



*Note: As above, the OIA provides data on majors by semester, not by year*

**Figure 6. GES majors by Race/Ethnicity**

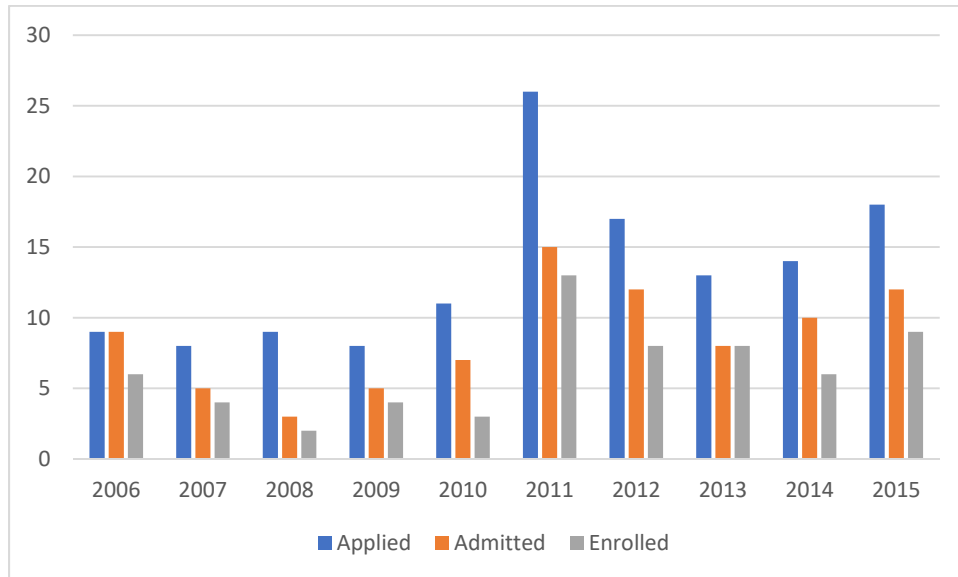


*Note: As above, the OIA provides data on majors by semester, not by year*

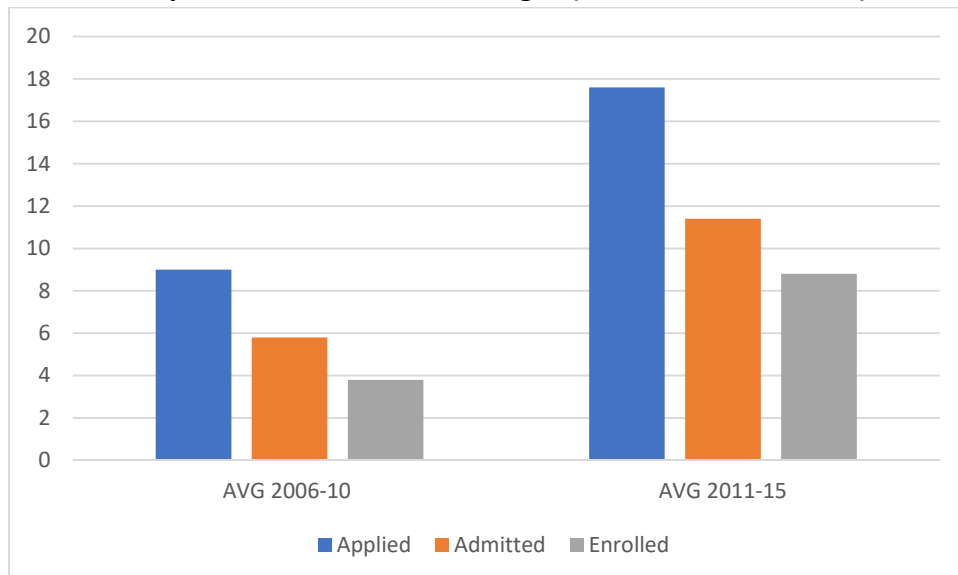
## Graduate Program

The M.S. Geography program has seen an overall increase in enrollments over the last decade, as shown in Figure 7 and especially Figure 8 below. From the 2006-2010 time period to the 2011-2015 period, admission rates remained more or less constant (at a 65% acceptance rate) and enrollment rates increased somewhat (from 67% to 78%). Not reflected in these data is the effort that has gone into improving graduate recruitment so that applicants are well suited for the program in terms of both scholarly potential and topical interests.

**Figure 7. M.S. Geography Applications, Admissions, and Enrollments  
2006-2015**



**Figure 8. M.S. Geography Applications, Admissions, and Enrollments  
Comparison of Five-Year Averages (2006-10 and 2011-15)**



**4B (reflection question #1). Explain if students’ demand for your GenEd courses generate sufficient revenue to improve resources and the quality of Geography GenEd courses as well as maintain an efficient instructional staff?**

As described above, we have seen decreasing enrollments in our classroom version of GEOG101 in the last few years, potentially due to increased enrollments in the similar and better-supported EPS101 course. At the same time, we have seen increasing enrollments in our classroom version of GEOG140 and in our online offerings of GEOG101, GEOG102, and GEOG140.

Since we do not receive any revenue based on student enrollment (other than course fees, which are used to provide direct student support in our computer lab), increases or decreases in enrollment have no effect on the resources available for or instructional quality in Geography GenEd courses. We have very few Teaching Assistants, and we concentrate the efforts of these support positions on our technical and lab courses, leaving virtually no instructional support for the GenEd courses beyond the instructor of record. As a result, we maintain an extremely efficient instructional staff for these courses, but this is also our biggest obstacle to experimentation and improvement.

**Instructional Support for Geography GenEd Courses**

<b>GenEd Courses</b>	<b>Sections offered per year</b>	<b>Typical section enrollment</b>	<b>Annual FTE assigned (as TAs)</b>	<b>Notes</b>
GEOG101 Home Planet	2	100-120	0.0	Course typically limited to lecture, with exams.
GEOG101 online	3	30-35	0.0	Taught by PTI, enrollment limited by lack of TA support.
GEOG102 People and Place	2	80-100	0.0	Course typically limited to lecture, with exams.
GEOG102 online	2	30-35	0.0	Taught by PTI, enrollment limited by lack of TA support.
GEOG105L Home Planet Lab	8	15-20	1.0	Course taught entirely by TAs, supervised by faculty member.
GEOG140 Intro World Regions	2	110-120	0.25	One offering per year taught in learning studio, with peer learning approach supported by TA. Second offering is lecture.
GEOG140 online	1	65-75	0.25	Taught once per year with TA support that allows for higher enrollment. Uses similar approach to learning-studio version of the course.

**4B (reflection question #2). From 2010 through 2015, the B.S. program in Geography had an average time-to-degree of 6.1 years, which is among the highest on campus. What factors are influencing this outcome? What steps could be made to address this outcome?**

We suspect that the anomalous time-to-degree length for B.S. Geography majors is partly an artifact of small sample size, exacerbated as the result of an incomplete dataset, which includes only first-time, full-time freshmen (and does not match our own records for total number of majors). We attempted to determine whether transfer status might contribute to the time-to-degree length by requesting data for how many Geography majors arrive at UNM as transfer or part-time students vs first-time full-time freshmen, when compared with other majors. Unfortunately, however, we were not able to get any data that would help us answer this question.

Aside from the possibility that the time-to-degree length for B.S. Geography students is merely a data artifact, we have also considered that many Geography students seemingly declare the major late in their UNM careers due to a lack of pre-existing familiarity with the discipline and its content. (This is consistent with GES faculty observations and with anecdotal reports from colleagues in higher-ed Geography programs around the country.) To investigate this as a potential impact on time-to-degree, we requested the following data from OIA:

1. Average # of semesters from UNM entry until declaration of the major (focusing only on the FINAL major in which the student graduates, not any intermediate majors), broken down by final major
2. Average # of semesters from declaring the final major until graduation, broken down by final major
3. Average # of majors students declare before settling on a final major, broken down by final major

We received a partial response to Query #3, learning that UNM students who begin as first-time, full-time freshmen change majors on average .93 times (i.e. a bit less than once). On the other hand, the 67 Geography students found in the same timeframe changed an average of 1.88 times (i.e., almost twice). This may explain the longer time to degree found among Geography students, but we are not able to confirm this without comparing to other programs, and without answers to the first two questions.

**4C. Provide a description of program advisement for students.**

Undergraduate program

Undergraduate program advisement takes place on an individual basis, and is performed by the Undergraduate Program Director, who works closely with University Advising to respond to student questions and needs regarding graduation requirements. The Undergraduate Director also meets with students to discuss career options and course selections that best meet individual goals. Finally, the Director works with transfer students to ensure a smooth transition to UNM.

Graduate program

The graduate program is formally overseen by a faculty Graduate Program Director, who provides individual student advising to prospective and admitted students. The program is also structured to include a two-course core sequence in the first year (GEOG501 and GEOG502), in which students are guided through various aspects of navigating the program requirements. Each M.S. Geography

student is also assigned a faculty adviser at the time of admission, to ensure that faculty support is available for research topic selection, committee formation, and preparation for graduate examinations.

#### **4D. Describe any student support services that are provided by the unit.**

##### Undergraduate programs

Aside from advising, GES does not provide direct student support services to undergraduates.

##### Graduate program

In addition to advising, GES provides graduate students with office space, subsidized conference travel to regional and national conferences, and competitive travel funding for national conferences.

#### **4E. Describe any student success and retention initiatives in which the unit participates.**

GES does not participate formally in any student success and retention initiatives.

#### **4F. Provide a summary of the success of graduates of the program by addressing the following questions:**

##### **Where are graduates typically placed in the workforce?**

According to our 2016 alumni survey approximately 56% of respondents are currently working or seeking work in a field related to geography or are currently pursuing additional higher education. While this number is not particularly high, we believe that it also reflects the breadth of training that geography offers for students seeking to pursue careers in a broad range of professions (as well as the fact that a number of respondents are currently retired). This impression is substantiated by the range of employer types identified by respondents, including:

- For profit organizations (35.71%)
- Nonprofit organizations (1.79%)
- Government (30.36%)
- Health Care (1.79%)
- Education (19.64%)

Likewise, survey respondents' included a number of careers that while not directly "geographic," are well supported by the competencies supported by the program's learning goals including: professor, landscape ecologist, program director, lawyer, institutional researcher, and information security analyst.

##### **Are placements consistent with the program's learning goals?**

As discussed above, the program's learning goals are extremely broad, seeking not only to prepare graduates as professionals in geography and related fields, but also as professionals who draw upon the broader geospatial and social science perspectives that run throughout the program. Accordingly, the 2016 survey suggests that our placements are very much in accord with programmatic learning goals. This is reflected in the responses to question 9, which indicate the two most common occupational field for our graduates as Architecture and Engineering (21%) and Education, Training, and Library (17.54%), neither of which are inherently geographic, but nonetheless potentially draw heavily on the competencies supported by our programmatic learning goals.

### **What methods are used to measure the success of graduates?**

Our primary method is the use graduate self-reporting through an alumni survey. Specifically, the 2016 survey asks the extent to which alumni agree with the following statements, which track onto our programmatic learning goals:

- My degree and major coursework have prepared me well to develop an ability to see meaning in the arrangement of things in space.
- My degree and major coursework have prepared me well to become a geographical problem-solver capable of using qualitative, quantitative and/or spatial methods of research appropriate to your level of training
- My degree and major coursework have prepared me well to develop an ability to see meaningful relationships between people, places, and the environment
- My degree and major coursework have prepared me well to become a clear and effective communicator.

### **What are the results of these measures?**

Overall, and to date, the results are reflected in the tables generated in response to these questions, with students indicating that they either strongly or somewhat agree to each of the questions as follows (relative frequency):

- My degree and major coursework have prepared me well to develop an ability to see meaning in the arrangement of things in space. (82.67%)
- My degree and major coursework have prepared me well to become a geographical problem-solver capable of using qualitative, quantitative and/or spatial methods of research appropriate to your level of training (76%)
- My degree and major coursework have prepared me well to develop an ability to see meaningful relationships between people, places, and the environment (82.67%)
- My degree and major coursework have prepared me well to become a clear and effective communicator. (68%)

## Criterion 5. Faculty

The faculty associated with the unit's programs should have appropriate qualifications and credentials. They should be of sufficient number to cover the curricular areas of each program and other research and service activities. (Differentiate by program where appropriate.)

### 5A. Describe the composition of the faculty and their credentials. Provide an overall summary of the percent of time devoted to the program for each faculty member and roles and responsibilities within each program.

At the outset of this section, we note that GES has experienced a large number of faculty changes in the past year, and many of them are not reflected in the datasets provided by UNM's Office of Institutional Analytics (which were current as of 31 October 2015). The changes are summarized below and are reflected to the extent possible in the text that follows, even though they are not included in any of the institutional datasets.

- Addition of one new tenure-track Assistant Professor in fall 2016 (Lin)
- Replacement of a visiting professor in fall 2016 (resignation of Xiao + hire of Gong)
- Retirement of a Lecturer in December 2016 (Seidler)
- Incoming transfer of two tenure-track faculty from the Department of Anthropology in January 2017 (Smith and Brulotte)
- Authorization of a spousal hire to begin Fall 2017 (Warner)

In the October 2015 dataset provided by OIA, GES had 8 voting tenure/tenure track faculty members, with the following breakdowns for gender and ethnicity/race:

- Male 62.5%
- Female 37.5%
- Hispanic: 0%
- Non-Hispanic White: 87.5%
- Race/Ethnicity Unknown: 12.5%
- International: 0%

GES also had one lecturer (white male), one visiting professor (international female), and up to four temporary part-time instructors (PTIs) during the year based on need.

Tenure/Tenure-Track Faculty by Gender and Ethnicity											
Ethnicity	Gender	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hispanic	F	0	0	0	0	0	1	0	0	0	0
	M	0	0	0	1	1	0	0	0	0	0
White, Non-Hispanic	F	0	1	2	2	2	2	2	2	2	2
	M	4	2	3	5	6	7	8	6	6	5
Race/Ethnicity Unknown	F	0	0	0	0	0	0	0	0	1	1
	M	0	0	0	0	0	0	0	0	0	0
International	F	0	0	0	0	0	0	0	0	0	0
	M	0	1	1	0	0	0	0	0	0	0

*Data frozen on or around October 31 of each year. Employee not active on that date are not included in the data file.*



As shown in this table (below), GES has experienced a marked increase in tenured and tenure-track faculty in the last decade, coinciding with a decrease in the FTE of temporary faculty. This growth has occurred despite UNM’s constrained budget environment, reflecting both (1) an institutional commitment from the College of Arts & Sciences to invest in Geography as a discipline and (2) the willingness of GES to provide a comfortable faculty home for spousal hires and transfer faculty from cognate fields such as Anthropology, Law, Sustainability Studies, and Environmental Engineering.

**Total GES faculty, by rank, 2006-2017**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<i>Professor</i>	3	2	2	2	3	3	3	1	1	1	1	1
<i>Associate Professor</i>	1	1	1	1	1	2	2	4	5	5	5	7
<i>Assistant Professor</i>	0	1	3	4	4	4	5	3	3	2	3	4
<i>Instructor</i>	0	0	0	0	0	0	0	1	0	0	0	0
<i>Instructional Faculty</i>	1	1	0	0	0	0	0	1	1	1	1	0
<i>Visiting Faculty</i>	0	0	0	0	0	0	0	1	1	1	1	1
<i>Research Faculty</i>	0	0	0	0	0	1	0	0	0	0	0	0
<i>Temporary Faculty</i>	2	4	4	1	4	1	2	0	1	0	1	1
<i>Total Faculty</i>	7	9	10	8	12	11	12	11	12	10	12	14
<i>Faculty by department based on tenure department. For non-tenure track faculty, temporary faculty, and post-docs, department based on assignment. Employee data are frozen on or around October 31 of each year. Employees not active on that date are not included in the datafile. Data source: ORD EmployeeCount database maintained by Institutional Analytics, UNM Office of Institutional Analytics: Heather Mechler. Some cells corrected based on internal GES knowledge.</i>											<i>These two columns generated by GES, based on actuals (2016) and commitments (2017)</i>	

The qualifications and credentials of all continuing faculty in GES are summarized in the table that begins on the following page. Please note that all of the recent faculty changes are reflected in this table, including those that post-date the OIA dataset. Recent or prospective arrivals are noted in the table.

We have also included an appendix (Appendix F) that provides the APR-required codes to designate faculty expertise and scholarly credentials.

Name	Title	Degree	Primary Research Area(s)
<b>Benson, Melinda H</b>	Associate Professor Associate Chair 100% GES appointment	JD	Environment and natural resource management; adaptive management; social/ecological systems
<b>Brulotte, Ronda</b> [transfer to GES as of January 2017]	Associate Professor Director, Latin American Studies 50% appointment outside GES	PhD	Food systems, tourism geography, critical heritage studies, commodities and materialism, transnational indigeneity, Mexico, Latin America
<b>Carr, John N</b>	Associate Professor  Grad Program Director 100% GES appointment	PhD JD	Urban Geography; Globalization and Post Colonialism; Legal Geography; Critical Theory; Public Space and Culture; Activist Research Methods
<b>Duvall, Chris S.</b>	Associate Professor Physical Geography Coordinator 100% GES appointment	PhD	Biogeography; Cultural and historical ecology; African Diaspora; Food geography; Science studies
<b>Freundschuh, Scott M</b>	Professor Undergrad Director 100% GES appointment	PhD	Geographic Information Science, Spatial Cognition, Spatial Information Design, and Cartography
<b>Gong, Xi</b> [began fall 2016]	Visiting Assistant Professor 100% GES appointment	PhD	Geographic Information Science, Health and the Environment, Spatio-Temporal Data Mining, GIS Modeling
<b>Hadjilambrinos, Constantine</b>	Associate Professor  Assessment Coordinator 100% GES appointment	PhD	Energy Resources, Environmental Policy, Science-Technology-and Society, Relationship between Culture and Nature
<b>Lane, Kristina Maria D</b>	Associate Professor  Dept. Chair 100% GES appointment	PhD	Historical Geography, Environmental Knowledge, Colonialism, History and geography of science, History of Cartography, Legal Geography
<b>Lin, Yan</b> [Began fall 2016]	Assistant Professor  100% GES appointment	PhD	Geographic Information Science (GIS), Spatial Data Analysis, WebGIS, Health and Medial Geography, Spatial Epidemiology, Health Disparities
<b>Lippitt, Caitlin L</b>	Assistant Professor  100% GES appointment	PhD	Biogeography, invasive species, remote sensing of vegetation, fire ecology, the role of disturbance in plant communities.
<b>Lippitt, Christopher</b>	Assistant Professor Special Assistant to the Associate Dean for Research 100% GES appointment	PhD	Remote Sensing; Geographic Information Science; Time-Sensitive Geographic Information.
<b>Smith, Lindsay</b> [transfer to GES as of January 2017]	Assistant Professor  100% GES appointment)	PhD	Social and ethical dimensions of genetics, medical geography, science studies, transnational justice, feminist geography, Latin America
<b>Warner, Ben</b> [begins August 2017]	Assistant Professor  100% GES appointment	PhD	Water governance and institutions; Latin America; Vulnerability, risk, and adaptation; Political economy; Development studies; Mixed methods

**5B. Provide information regarding professional development activities for faculty within the unit.**

GES has made it a standard practice to provide funding for new Assistant Professors to attend the professional development workshops offered by the Geography Faculty Development Alliance. With only one exception, faculty members who joined GES as junior faculty have attended (or will attend) the week-long seminar to engage in a variety of professional training sessions.

Aside from this department-funded opportunity, many faculty take advantage of free workshops offered at UNM or pursue training/development that is available within their professional networks.

**5C. Provide a summary and examples of research/creative work of faculty members within the unit.**

**Melinda Harm Benson, Associate Professor:** Received her J.D. from the University of Idaho in 1998. She conducts research on environmental governance regimes — how we conceptualize, employ and protect the natural world. She is a leading scholar in the area of legal geography and has made influential contributions to a conceptual rethinking of ideas like sustainability and resilience. She has published numerous high-impact articles and is now co-authoring a book titled *The End of Sustainability* (under contract with University Press of Kansas).

Sample Publications:

- **Benson, M.H.** (2016). Shifting Public Land Management Paradigms: Lessons from the Valles Caldera National Preserve. *Virginia Environmental Law Journal*, 34(1), 1-51.
- **Benson, M.H.**, C. Lippitt, R. Morrison, B. Cosens, J. Boll, B.C. Chaffin, R. Heinse, D. Kauneckis, T. E. Link, C. Scruggs, M. Stone, V. Valentin. (2015). Five Ways Institutions Can Support Interdisciplinary Work Before Tenure, *Journal of Environmental Studies and Sciences*; 6(2), 260-267.
- **Benson, M.H.** (2015). Reconceptualizing social-ecological relations – is resilience the new narrative? *Journal of Environmental and Sustainability Law* 99-127.
- **Benson, M.H.**, D. Llewellyn, R. Morrison and M. Stone (2014). Water Governance Challenges in New Mexico's Rio Grande Valley: a Resilience Assessment, *Idaho Law Review* 51:195-228.
- **Benson, M.H.** and R.K. Craig (2014). "The End of Sustainability," *Society & Natural Resources: An International Journal*; Vol. 27(7) 777-782; <http://dx.doi.org/10.1080/08941920.2014.901467>

**John Carr, Associate Professor:** Received his PhD in Geography from the University of Washington in 2007 and his J.D. from the University of Texas-Austin School of Law in 1993. His research interests include urban geography, globalization and post colonialism, legal geography, critical theory, public space and culture, and activist research methods. He is a university-wide leader in innovative pedagogy who was awarded UNM's top teaching award for pre-tenure faculty in 2013. In 2016, he is the recipient of research and teaching fellowships at the University of Tasmania in Hobart, Australia and Canterbury University in Christchurch, New Zealand. His research on geocoded data privacy and ethics has been supported by the National Science Foundation.

Sample Publications:

- **Carr, J.**, Dickinson, E. A., McKinnon, S., & Chávez, K. (2016). Kiva's Flat, Flat World: The Placelessness of Microcredit in Cyberspace. *Globalizations* 13(2), 143-157.

- Carr, J., Vallor S., Freunds Schuh S., Gannon, W., Zandbergen, P. (2014), Hitting the moving target: the challenges of creating a dynamic curriculum addressing the ethical dimensions of geospatial data, *Journal of Geography in Higher Education*. 38(4), 444-454.
- Carr, J. (2014) Invited Chapter: "Making Urban Politics Go Away: The role of legally mandated planning processes in occluding city-level power." In M. Davidson and D. Martin (Eds.) *Urban Politics: Critical Approaches*. Sage (London)[Article].
- Carr, J. (2012). Public Input/Elite Privilege: The use of participatory planning to reinforce urban geographies of power in Seattle. *Urban Geography*, 33(3). 420-441.
- Carr, J. (In press, submitted June 2, 2016) Skateboarding in Dude Space: The roles of space and sport in constructing gender among adult skateboarders, *Sociology of Sport Journal*
- Carr, J., Dickinson, E. A., McKinnon, S., & Chávez, K. (2016). Kiva's Flat, Flat World: The Placelessness of Microcredit in Cyberspace . *Globalizations* 13(2), 143-157.

**Chris Duvall, Associate Professor:** Received his PhD in Geography from the University of Wisconsin Madison in 2006. He is a biogeographer who studies the historical and contemporary distribution patterns of humans, plants, animals, and the environmental conceptions that link them together. Dr. Duvall's most recent research focuses on the Transatlantic exchange of environmental knowledge and practice, with a particular focus on the role of West Africa. He is the author of the 2015 book *Cannabis* (Reaktion books), which traces the global origin and spread of cannabis from both a biological and cultural perspective.

#### Sample Publications:

- Duvall, C.S. 2017. Science, society, and knowledge of the Columbian Exchange: The case of *Cannabis*. In *Environmental History in the Making. Volume I: Explaining* (E. Vaz, C. Joanez de Melo, & L.M. Costa Pinto, eds.): 225-241. Springer Publishing: New York.
- Sluyter, A. and C.S. Duvall. 2016. African rangeland burning and colonial ranching landscapes in the neo-tropics. *The Geographical Review* 106(2): 294-311.
- Duvall, C.S. 2016. Drug laws, bioprospecting, and the agricultural heritage of *Cannabis* in Africa. *Space and Polity* 20(1): 10-25.
- Duvall, C.S. 2015. *Cannabis*. London: Reaktion Books.
- Duvall, C.S. 2015. Geography. In *The Princeton Companion to Atlantic History* (J.C. Miller, ed.). MTM Press: New York.
- Duvall, C.S. 2011a. Biocomplexity from the ground up: Vegetation patterns in a West African savanna landscape. *Annals of the Association of American Geographers* 101(3): 497-522.

**Scott Freunds Schuh, Professor:** Received his PhD in Geography in 1992 from the State University of New York at Buffalo. His research focuses on cognitive science and spatial cognition as it relates to types of spatial knowledge and their structures, geographic scale, and spatial concept development and understanding. He is an active and influential scholar at the national level and served previously as a program director at the National Science Foundation. He is currently executive editor of the journal *Cartography and Geographic Information Science* and is the Vice President of the Coalition of Geospatial Organizations (COGO).

#### Sample Publications:

- 2015 Fabrikant, S.I., M. Raubal, M. Bertolotto, C. Davies, S. Freunds Schuh, and S. Bell (Eds.). Proceedings, Conference on Spatial Information Theory (COSIT 2015), Santa Fe, NM, USA, Oct.
- 12-16, 2015. Lecture Notes in Computer Science (LNCS) 9368, Springer, Berlin, Germany.

- 2015 Kitchin, R. and S.M. Freundschuh, (Eds.) *Cognitive Mapping: Past, Present and Future*, Taylor and Francis, 280 pp. ISBN 0415757800
- 2014 Carr, J., S. Vallor, S. Freundschuh, W. Gannon and P. Zandbergen. Hitting the moving target: the challenges of creating a dynamic curriculum addressing the ethical dimensions of geospatial data. *Journal of Geography in Higher Education*, 38(4): 444-454.  
<http://dx.doi.org/10.1080/03098265.2014.936313>
- 2012 Freundschuh, S.M. and M. Blades, The Cognitive Development of the Spatial Concepts NEXT, NEAR, AWAY and FAR, In M. Raubal, A. Frank and D. Mark (Eds.) *Cognitive and Linguistic Aspects of Geographic Space – New Perspectives on Geographic Information Research*, Springer, pp. 43-62.

**Xi Gong, Visiting, Professor:** received his Ph.D. in Geographic Information Science at Texas State University in 2016. His research interests include: Geographic Information Science, Health and the Environment, Spatio-Temporal Data Mining, GIS-Based Modeling,

Sample Publications:

- **Gong, X.**, Brender, J.D., Langlois, P.H., Lin, Y., Zhan, F.B. 2016. Validity of the Emission Weighted Proximity Model in estimating air pollution exposure intensities in large geographic areas. *Science of the Total Environment*. 563–564: 478–485.
- Lin, Y., **Gong, X.**, Mousseau, R. 2016. Barriers of Female Breast, Colorectal, and Cervical Cancer Screening Among American Indians—Where to Intervene? *AIMS Public Health*, 3 (4): 891-906.
- Lin, Y., **Gong, X.** 2015. Risk Assessment of Water Pollution Exposure to Hazardous Waste Sites: A case study in Bexar County, Texas. *Papers in Applied Geography*. DOI: 10.1080/23754931.2015.1116105
- Zhang, C., Yang, J., Zhan, F.B., **Gong, X.**, Brender, J.D., Langlois, P.H., Barlowe, S., Zhao, Y. 2015. A Visual Analytics Approach to High-Dimensional Logistic Regression Modeling and its Application to an Environmental Health Study. *IEEE PacificVis 2016*.
- Brender, J.D., Shinde, M.U., Zhan, F.B., **Gong, X.**, Langlois, P.H. 2014. Maternal Residential Proximity to Chlorinated Solvent Emissions and Birth Defects in Offspring: A Case-Control Study. *Environmental Health*, 13(96): 1-16.

**Constantine Hadjilambrinos, Associate Professor:** Received his PhD in Urban Affairs and Public Policy from the University of Delaware 1993. He conducts research in energy resources, environmental policy, and the relationship between science, technology, and society. Dr. Hadjilambrinos is an expert on European energy policy and has held both academic and professional positions in the U.S. and abroad. Before coming to UNM, he served as the Head of Renewable Energy Policy for the New Mexico Public Regulation Commission.

Sample Publications:

- Thiel, D. and Hadjilambrinos, C. (Translators) Alexis Stamatis, *American Fugue*, Wilkes Barre, PA: Etruscan Press, 2008.
- Guest editor, Special Theme Issue on Global Climate Change, *Bulletin of Science, Technology and Society*, Vol. 19, No. 6, 1999.

- Hadjilambrinos, C. and Thiel, D. (2016) "Engaging the World: Literature, Science, and the Call to Action on Global Warming" *International Journal of Management and Applied Science*, Vol. 2, No. 5, pp. 13-18.
- Hadjilambrinos, C. (2006) "The High-Level Radioactive Waste Policy Dilemma: Prospects for a Realistic Management Policy" *Journal of Technology Studies*, Vol. 32, No. 2, pp. 95-103.
- Hadjilambrinos, C. (2005) "Electricity Industry Restructuring: Lessons from the British and Norwegian Experience." *IEEE Technology and Society Magazine*, Vol. 24, No. 4, pp. 27-35.

**Maria Lane, Associate Professor:** Received her PhD in Geography from the University of Texas at Austin in 2006. She is a historical geographer who studies the scientific, legal, and political processes that influence decisions about natural resource management. An award-winning teacher at UNM, Dr. Lane employs numerous graduate students in a variety of scholarly positions, including editorial fellowships for the journal *Historical Geography*, for which she serves as editor. Dr. Lane is the author of a 2011 book *Geographies of Mars* (University of Chicago Press) that explores early thinking about natural resources on the planet Mars, and is currently writing a book about water management in New Mexico titled *Fluid Geographies* (under contract with University of Chicago Press).

#### Sample Publications:

- Lane, K. Maria D. (2011) *Geographies of Mars: Seeing and Knowing the Red Planet* (Chicago: University of Chicago Press) ISBN: 9780226470788.
- Lane, K. Maria D. (in press) "Bridging the Florida Keys: engineering an environmental transformation, 1904-1912." In *American Environment Revisited*, eds. Geoff Buckley and Yolanda Youngs (Rowman & Littlefield).
- Lane, K. Maria D. (2016) "Pros and cons of a cosmopolitan classroom," in *Going Inward: the Role of Cultural Introspection in College Teaching*, eds. S. D. Longerbeam and A. F. Chávez (New York: Peter Lang Publishing), pp. 181-190.
- Rebecca Lave, Matthew W. Wilson, Elizabeth S. Barron, Christine Biermann, Mark A. Carey, Chris S. Duvall, Leigh Johnson, **K. Maria Lane**, Nathan McClintock, Darla Munroe, Rachel Pain, James Proctor, Bruce L. Rhoads, Morgan M. Robertson, Jairus Rossi, Nathan F. Sayre, Gregory Simon, Marc Tadaki and Christopher Van Dyke (2014) "Intervention: Critical physical geography." *Canadian Geographer* 58(1): 1-10.
- Perramond, Eric P. and K. Maria D. Lane (2014) "Territory to state: law, power, and water in New Mexico," in *Negotiating Territoriality: Spatial Dialogues between State and Tradition*, eds. Allan Charles Dawson, Laura Zanotti, and Ismael Vaccaro (New York: Routledge), 142-162.

**Yan Lin, Assistant Professor:** received her PhD at Texas State University in Geographic Information Science in 2014. Her expertise is in GIS and health/medical geography. Her research has focused on the development of GIS and spatial analysis methods and their applications in order to gain a better understanding of relationships among human health, the society, and the environment. This includes research in GIS engages spatial analysis and modeling, including web-based spatial demographic research and data mining. Her work in health/medical geography focuses on health disparities, including cancer prevention and control, as well as the development of targeted intervention programs to reduce health disparities.

Sample Publications:

- **Lin, Y.**, Gong, X., and Mousseau, R. 2016. Barriers of Female Breast, Colorectal, and Cervical Cancer Screening Among American Indians—Where to Intervene? *AIMS Public Health* 3 (4): 891-906
- **Lin, Y.**, and Wimberly, M. 2016. Geographic Variations of Colorectal and Breast Cancer Late-Stage Diagnosis and the Effect of Neighborhood-Level Factors. *Journal of Rural Health*. (In press) Available at <http://onlinelibrary.wiley.com/doi/10.1111/jrh.12179/pdf>
- Gong, X., Brender, J. D., Langlois, P. H., **Lin, Y.**, and Zhan, F. B. 2015. Validity of the Emission Weighted Proximity Model in estimating air pollution exposure intensities in large geographic areas. *Science of the Total Environment* 563, 478-485
- **Lin, Y.** and Gong, X. 2016. Risk Assessment of Water Pollution Exposure to Hazardous Waste Sites: A case study in Bexar County, Texas. *Papers in Applied Geography*. (In Press) <http://dx.doi.org/10.1080/23754931.2015.1116105>
- Zhan, F.B. and **Lin, Y.** 2016. Data Structure, Vector. *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology*. (In press)
- **Lin, Y.**, Schootman, M., and Zhan, F. B. 2015. Racial/Ethnic, Area Socioeconomic, and Geographic Disparities of Cervical Cancer Survival in Texas. *Applied Geography* 56: 21-28.

**Caitlin Lippitt, Assistant Professor:** Received her PhD from the joint program at San Diego State University and the University of California, Santa Barbara in 2013. Her research is focused on leveraging remotely sensed data to identify land cover change at multiple scales for monitoring and managing disturbance in semi-arid and arid environments. She collaborates actively with biologists and has significant research expertise in the study of landscape disturbance effects, including drought, wildfire, and invasive species.

Sample Publications:

- Lippitt, C.L., Stow, D., O’Leary, J.O., Franklin, J. 2013. The influence of short-interval fire occurrence on post-fire recovery of fire-prone shrublands in California, USA. *International Journal of Wildland Fire* 22, 184-193.
- Deutschman, D., Strahm, S., Stow, D.A., Lippitt, C.L., and Coulter, L.L. 2013. Vegetation Monitoring for the San Diego Multiple Species Conservation Program: Comparison of Vegetation Community Mapping, Remote Sensing using MESMA, and Field Data. *SANDAG Final Report 2013*.
- Stow, D., Toure, S. Lippitt, C.L., Lippitt, C.D., Lee, C. 2012. Frequency distribution signatures and classification of within-object pixels, *International Journal of Applied Earth Observation and Geoinformation* 15, 49-56.

**Christopher Lippitt, Assistant Professor:** Received his PhD from the joint program at San Diego State University and the University of California, Santa Barbara in 2010. His research is in developing methods and theory to improve the effectiveness of remote sensing and GIS technologies when applied to time-sensitive problems like disaster response, and to understand the dynamics and feedback effects within the human-environment relationship. Dr. Lippitt has a very active sponsored research program, with major grants from the National Science Foundation and the New Mexico Department of Transportation. He is co-editor of the 2015 book *Time-Sensitive Remote Sensing* (Springer Press).

### Sample Publications:

- Stow, D.A., L.L. Coulter, C.D. Lippitt, G. MacDonald, R. McCreight, and N. Zamora. 2016. Evaluation of Geometric Elements of Repeat Station Imaging and Registration. *Photogrammetric Engineering & Remote Sensing* 82(10): 775-788.
- Lippitt, C.D., D.A. Stow, and P.J. Riggan. 2016 Online. Application of the remote-sensing communication model to a time-sensitive wildfire remote-sensing system. *International Journal of Remote Sensing* Vol. 37 No.14, 3272-3292.
- \*Zhang, S., S.M. Bogus, C.D. Lippitt, Giovanni C. Migliaccio. 2016 *Online*. Estimating Location-Adjustment Factors for Conceptual Cost Estimating Based on Nighttime Light Satellite Imagery. *Journal of Construction Engineering and Management*. DOI: 10.1061/(ASCE)CO.1943-7862.0001216.
- \*Zhang, S. C.D. Lippitt, S. Bogus, P. Neville. 2016. Characterizing Pavement Surface Distress Conditions with Hyper-Spatial Resolution Natural Color Aerial Photography. *Remote Sensing* 8(5): 392.
- \*Krofcheck, D.J., M.E. Litvack, C.D. Lippitt, and A. Neuenschwander. 2016. Woody Biomass Estimation in a Southwestern U.S. Juniper Savanna Using LiDAR- Derived Clumped Tree Segmentation and Existing Allometries. *Remote Sensing* 8(6), 453.
- \*Kirk, Scott, A.E. Thompson, C.D. Lippitt. 2016. Predictive Modeling for Site Detection Using Remotely Sensed Phenological Data. *Advances in Archeological Practice* 4(1), pp. 87-101.
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### GES Affiliated Faculty

In addition to the permanent faculty listed above, UNM's Department of Geography and Environmental Studies has close relationships with a number of scholars and researchers outside the department. The following affiliated faculty members collaborate with GES faculty on research initiatives, offer cross-listed courses, serve on graduate student committees or otherwise participate in the scholarly life of the department.

- **Daniel D. Arreola** (Arizona State University, School of Geographical Sciences & Planning) Expertise: cultural landscapes, place-making, Mexican-American borderlands
- **Karl Benedict** (UNM College of University Libraries and Learning Sciences) Expertise: information architecture, spatial data management
- **Bob Berrens** (UNM Department of Economics, Water Resources Program) Expertise: environmental economics, water resources
- **David Correia** (UNM Department of American Studies) Expertise: environmental politics, law and violence, critical human geography, New Mexico and the U.S. Southwest
- **Jeff Erbig** (UNM Department of History) Expertise: historical GIS, history of cartography, Latin America
- **Fred Gibbs** (UNM Department of History) Expertise: interactive mapping + urban ecologies, historical GIS, food systems, public health
- **Moises Gonzalez** (UNM Community & Regional Planning Program) Expertise: spatial planning, GIS



- **Laura Harjo** (UNM Community & Regional Planning Program) Expertise: community development, GIS
- **Anne Jakle** (UNM EPSCOR Project Associate Director) Expertise: energy policy, resource management
- **Marcy Litvak** (UNM Department of Biology) Expertise: ecosystem ecology, effects of climate variability and disturbance
- **Bruce Milne** (UNM Department of Biology, Sustainability Studies Program) Expertise: ecoculture, environmental communication, environmental meaning systems, ecological identity, nature tourism, transformative ecopedagogy
- **Tema Milstein** (UNM Department of Communication & Journalism) Expertise: environmental communication, nature tourism
- **William Pockman** (UNM Department of Biology) Expertise: ecosystem ecology, plant distributions, climate change response
- **Caroline Scruggs** (UNM Community & Regional Planning Program) Expertise: environmental policy, public health, sustainable development
- **Mark Stone** (UNM Department of Civil Engineering) Expertise: environmental flows, fluvial geomorphology, ecosystem services
- **Jennifer Thacher** (UNM Department of Economics) Expertise: environmental economics, survey valuation
- **Marygold Walsh-Dilley** (UNM Honors College) Expertise: sociology of development, food and agricultural systems, indigenous politics

**5D. Provide an abbreviated vitae (2 pages or less) or summary of experience for each faculty member (if a program has this information posted on-line, then provide links to the information).**

See Appendix G for abbreviated vitas for all current faculty members. Note; Appendix does not include abbreviate vitas for incoming faculty members Ronda Brulotte, Lindsay Smith, or Ben Warner.

## Criterion 6. Resources and Planning

*The unit has sufficient resources and institutional support to carry out its mission and achieve its goals.*

**6A. Describe how the unit engages in resource allocation and planning. If the program or unit has an advisory board, describe the membership and charge and how the board's recommendation are incorporated into decision making.**

GES relies on its distributed structure for faculty governance in the planning and allocation of resources. The department holds an annual planning retreat, at which all faculty participate in the development and modification of long-term strategic plans. Based on these plans and the department's ongoing operations, the faculty Budget Committee develops a budget proposal each spring in consultation with the chair, the program directors, and the coordinators/chairs responsible for implementing various aspects of the GES mission. The Budget Committee then ranks all budget requests in order of priority, and the chair follows these priorities in developing a formal budget for UNM.

GES has an advisory board, but this group does not play a significant role in resource allocation. The board hears an annual report each spring and serves as a sounding board for strategic initiatives. Board feedback is communicated to the faculty as a whole each fall in the annual planning retreat.

**6A (reflection question #1) What are alternative avenues that have been or could be explored within UNM and/or statewide to generate additional revenue in order to maintain the quality of the programs and the courses offered?**

GES is currently developing a proposal for a Master's degree and graduate certificate in Geospatial Entrepreneurship. These programs, which are being developed in coordination with the Anderson School of Management and the UNM Innovation Academy, could be completed fully online. Because this would be a new type of program offered in a fully-online format, we expect that it could generate significant new tuition revenue from outside the current UNM student body (and outside the state). See Appendix H for a draft outline of the degree/certificate concept.

**6A (reflection question #2) Discuss what space efficiencies and resources could be had by collaborating with the department of Earth & Planetary Sciences?**

In response to this question, EPS leadership were invited to discuss the potential for space and resource efficiencies through collaboration. Although EPS enjoys tremendous resources, facilities, and infrastructure in comparison to GES, we did not identify any obvious methods or motives for joining forces beyond the ongoing collaboration between interdisciplinary research groups in our two departments. The disciplinary content of EPS and GES is tangential but not overlapping (i.e. there is a fundamental distinction between Environmental Science and Environmental Studies) which points toward the two department's separate trajectories and resource needs...

**6A (reflection question #3) Discuss if the creation of a joint PhD degree program with NMSU would increase enrollments?**

Once the New Mexico Joint Doctoral Program in Geography is well established, we anticipate having over 20 PhD students enrolled across the two universities, with 4+ PhD degrees being granted each year. It will take 4 to 5 years to establish the program, however, and we anticipate admitting 5 or fewer students into the program each year. Therefore, it will take at least 4 years before we have 20 PhD students in residence, and not all of these students will be full time. The table below is included in the Form D program proposal as Table 5.1.

**Six-Year Enrollment Projection for UNM Students**

Timing	New Students		Returning Students		Total Headcount		Student Credit Hrs
	Fulltime	PartTime	Fulltime	PartTime	Fulltime	PartTime	
Year 1	2	1	0	0	2	1	45
Year 2	2	1	2	1	4	2	90
Year 3	2	1	4	2	6	3	135
Year 4	2	1	6	3	8	4	180
Year 5	2	1	8	4	10	5	225
Year 6	2	1	8	5	10	6	234

The following assumptions were used in estimating enrollment and student credit-hour generation at UNM:

1. We assume that five students per year will enroll in the New Mexico Joint Doctoral Program in Geography, with 3/5 of these students based at UNM and 2/5 based at NMSU on average.
2. Full-time enrollment is estimated at 9 credit hours per semester, or 18 credits per year, although we acknowledge that actual credit hours may vary widely among individual students, depending on their program stage/progress.
3. Part-time enrollment is estimated at 4.5 credit hours per semester (since some students will enroll in 3 credits and others will enroll in 6 credits while attending part-time), or 9 credits per year.
4. Full-time students are expected to complete the program in five years and are not counted as returning for a sixth year.
5. Part-time students are expected to complete the program in an 8-yr average.
6. Although some students based at UNM will take courses offered by NMSU (thus generating tuition dollars at UNM but generating student credit-hours at NMSU for purposes of the funding formula), we assume that cross-enrollments in the joint program will be more or less offsetting between the two institutions. Therefore, the estimates for student credit hour generation at UNM do not reflect any adjustments related to cross enrollment.

In addition to these fairly modest enrollments within the program itself, we expect that the addition of even small numbers of doctoral-level students who can serve as Teaching Assistants or Instructors will allow for an expansion of undergraduate enrollments as well.

**6B. Provide information regarding the unit’s budget including support received from the institution as well as external funding sources.**

As shown in the table below, GES receives most of its funding through I&G funds allocated by the College of Arts & Sciences to pay salaries and fund general operations. This number fluctuates in tandem with changes in faculty and TA numbers. Grants and contracts also provided a major source of funding for the unit, with fluctuations tied closely to the number of GIScience faculty and the number of proposal submitted. Finally, it should be noted that a new curriculum fee was implemented in 2014 that now generates substantial revenue, which is used to pay the Lab Manager salary and to maintain the SCL.

REVENUE SOURCES	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Course Fees	\$9,585	\$8,130	\$12,410	\$16,970	\$16,485	\$12,905	\$12,813	\$68,131
Grants & Contracts (includes F&A)	\$98,905	\$103,549	\$25,143	\$123,045	\$156,690	\$35,768	\$15,099	\$132,104
Miscellaneous	\$909	\$27				\$120	\$29,542	\$1,184
Gifts, Endowment, and Interest income	\$1,195	\$649	\$1,264	\$1,875	\$1,368	\$1,019	\$54,091	\$4,405
I&G allocation (salaries, operations)	\$482,599	\$594,104	\$744,820	\$660,640	\$798,412	\$1,056,209	\$735,654	\$818,412

Note: Several revenue categories have been included within “I&G allocation” to reflect total revenue transfers from the College of Arts & Sciences to GES.

**6C. Describe the composition of the staff assigned to the unit (including titles and FTE) and their responsibilities.**

GES currently has two staff positions:

- Department Administrator, 1.0FTE – This position is the only administrative staff position in GES and provides critical support to both faculty and students in overseeing all internal and external business activities, accounting and finance, and human resources. GES relies on this person extensively to schedule courses, conduct budgeting/accounting, maintain non-computing facilities, reimburse travel expenses, initiate student hiring/contracts, enter timesheets, answer phones, and provide basic admin services to students and faculty. Our DA retired in December 2016, and the position is currently filled by a temporary employee. We have requested approval from the Provost to proceed with a replacement hire for this critical position despite the current hiring freeze, but we have yet to receive a response to our UNM Hiring Moratorium Waiver Form.
- Network Tech, 1.0FTE – This position manages and maintains computing and equipment resources related to student instruction and student research. This includes our 23-seat Spatial Computing Lab, an equipment storage and checkout facility, desk computers for grad students who are not funded by grants, a small server room, and a server-based network that connects these facilities together. This position was added in 2015 to handle the increasing needs of student computing in GES, and it is funded entirely with course fee revenue.

Historical staffing levels over the last decade have never been higher than the current level, as shown in the table below. The department has typically maintained a single administrative position (DA or AA) to run the office, while grant-funded research staff have occasionally been hired to work on

specific projects. The Network Tech (colloquially referred to as the “lab manager”) position is the first attempt in a decade to provide long-term technical support in GES.

**Total GES Staff by EEO-6 Category**  
(as of October 31 each year)

<b>EEO-6 Code</b>	<b>EEO-6 Category</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
3	Professional	2	2	2	0	0	1	0	0	0	1
4	Clerical/Secretarial	0	0	0	1	1	1	1	1	1	0
5	Technical/ParaProfessional	0	0	0	0	0	0	0	0	0	1
	<b>Total</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>

**6D. Describe the library resources that support the unit's academic and research initiatives.**

The UNM library system provides direct access to numerous electronic and print journals, databases, special collections, specialized librarian support and other information resources relevant to Geography and Environmental Studies (GES) teaching and research (see <http://libguides.unm.edu/geography>). GES has a designated librarian, Dr. Karl Benedict, who is available to assist with student training, research project support, library resource acquisition, and data management planning support. Students and faculty have electronic access to a wide variety of electronic databases (e.g. [http://library.unm.edu/find/databases.php?sub\\_id=52](http://library.unm.edu/find/databases.php?sub_id=52)), including the Web of Science, Academic Search Complete, Environment Complete search services; deep collections of subject area journals exemplified by the online access to the full set of [136 Taylor and Francis Geography-related journals](#); a significant map collection and related technical services available through the library's [Map and Geographic Information Center \(MAGIC\)](#); and access to desktop GIS software on all of the computers in the Centennial Science and Engineering Library. Dr. Benedict and other data librarians are also available to assist with funding agency mandated data management plans and support data (and other scholarly product) preservation (as required by funding agencies and an increasing number of publishers) in UNM's institutional repository, Lobovault (<http://repository.unm.edu>) or other appropriate disciplinary repositories.

## Criterion 7. Facilities

*The facilities associated with the unit are adequate to support student learning as well as scholarly and research activities.*

**7A. Describe the facilities associated with the unit and associated programs including, but not limited to, classrooms, program space (offices, conference rooms, etc.), laboratories, equipment, access to technology, etc.**

GES has minimally adequate facilities that have increasingly come under pressure during the unit's recent and sustained growth. At present, the department occupies, or will soon occupy, the entire second floor of Bandelier West (minus one office) as well as a substantial portion of Bandelier East.

### Faculty offices

All regular faculty are assigned to individual offices in Bandelier West that include basic furniture and storage space. As faculty size has expanded in the last decade, we have turned some project offices into faculty offices and have given up separate offices for temporary faculty, emeritus faculty, and for the department chair. The incoming transfers and new hires have forced us to request additional space from our neighboring units in Bandelier West: the Earth Data Analysis Center (EDAC) and the Department of Anthropology. At present, we have updated our space allocations in FAMIS to reflect the new assigned uses, but we will be out of office space when Ben Warner arrives. At that point, we will not have any office space available for temporary, part-time faculty to use for office hours.

### Staff and administrative offices

As mentioned above, we no longer maintain a separate office for the Department Chair. In Bandelier West, we have a small office for the Department Administrator (and any work-study students) as well as a separate mail/copy/breakroom that includes a copier, printers and sitting area. The Lab Manager occupies an office in Bandelier East adjoining the Spatial Computing Lab (see below).

### Student facilities

Graduate students are assigned desk space in a suite of deteriorating offices in Bandelier East. Priority is given to Teaching Assistants and Research Assistants, but we have essentially been able to accommodate every student who requests desk space in the last several years. The grad-student suite includes basic furniture, networked computing workstations, printers, and a sitting area. Students also have access to the SCL, GEM Lab, and equipment checkout facility described below.

### Classroom facilities

Aside from the Spatial Computing Lab (described in next section), GES does not control any classroom space proper. We share a conference room in Bandelier West with EDAC that doubles as a seminar room for both graduate and undergraduate courses with enrollment below 15.

### Research facilities

At present, GES maintains very minimal research facilities, including the computing facilities described below. GES has been included, however, in the planning for a new building (PAIS) that will open on campus in 2019 with dedicated office/research space for GES within an interdisciplinary science cluster. We expect that this space will be sufficient to seat 2-3 postdocs or research managers, and at least a dozen graduate students, pending approval of the final building plans.

## Facilities and infrastructure needs

Additional office and research space is desperately needed, as follows:

- An additional office in Bandelier West to serve as the official Chair/Dept. office, separate from the chair's faculty office. It is possible that we could negotiate with our in-building neighbors for this, but we have already pushed negotiations as far as we think they can go.
- An additional office in Bandelier West for part-time faculty to hold office hours. As above, we have limited options for generating this additional space. The opening of PAIS in 2019, however, will allow the GEMLab to relocate and free up that single office.
- A space in either building that can be configured as a student commons. This is particularly important as we turn attention to enhancing our undergraduate program, student services, and recruitment.
- A substantial renovation of the grad-student office suite in Bandelier East, with more efficient configuration that would allow for more desks/computers and a usable commons area.
- A second student computing facility that could remain open for student use even when classes are in session in the main SCL.

To this end, we have requested a full Space Needs Assessment for Bandelier East and West, in coordination with EDAC. The Planning & Campus Development office has informed us that the likely result of the assessment will be to place renovation of both buildings on the long-term capital projects list.

### **7B. Describe any computing facilities maintained by the unit.**

GES maintains an instructional computing lab and equipment checkout facility known as the Spatial Computing Lab (SCL) and a research computing facility known as the GI Science for Environmental Management (GEM) lab. Supporting both of these labs is a central server infrastructure.

#### The Spatial Computing Lab

The SCL, located in Bandelier East room 106, is GES' primary instructional computing facility and hosts field equipment available for checkout by GES students and faculty. The SCL host 24 workstations with large 16:9 displays, quad-core processors, 16GB of RAM, 1TB local hard drives, and 1GB GPU. When not in use for formal courses, the SCL serves as an open computing facility for GES majors and students enrolled in GES courses. Supported by a dedicated IT manager and work-study lab aids, SCL is typically open from 9am-9pm during the week and 10am-8pm on the weekends. Login authentication is through UNM Central IT, allowing students to access 1TB of network-attached storage upon login. The SCL host a large format plotter, projector and screen for presentations, and a host of software for cartography and spatial analysis. Software available through the SCL includes:

**Table 1. Software available in the Spatial Computing Lab**

<u>Software Title</u>	<u>Licensing</u>
Microsoft Office Suite	Unlimited seats
Adobe Creative Suite	27 seats
ESRI	Unlimited seats
ERDAS	8 seats
SPSS	27 seats
TerraSet (Idrisi)	Unlimited seats
Putty	Unlimited seats
7zip	Unlimited seats



Filezilla	Unlimited seats
Google Earth	Unlimited seats
Ghost	30 seats

Field equipment is available for free checkout by GES students and faculty. A basic list of equipment is included in Table 2.

**Table 2. Spatial Computing Lab equipment available for checkout**

<b>Equipment</b>	<b>Count</b>
Garmin Etrex 20	22
Pocket Stereoscopes	22
Sling Psychrometer	3
1m sampling squares	5
IR Thermometers	8
Plant Press	2
Tangent Height Gauge	5
50m tape measure	5
Seive Screen	1
N-P-K test kit	1

The SCL is serviced by two primary servers: 1. New Mexico and 2. Bosque. Both servers run the ESX - hypervisor operating system with virtual machines running Ubuntu Linux or Windows Server providing direct services. New Mexico serves as the primary license server while Bosque provides centralized network storage and serves as a backup license manager. See Table 5 for server specifications.

GI Science for Environmental Management Lab

The GEM Lab hosts 6 workstations, a variety of aerial imaging equipment, field survey equipment, and 2 remote access servers: 1. Roadrunner and 2. Spectral. See Table 5 for details on servers, Table 3 for software hosted by the GEM Lab, and Table 4 for details on research equipment.

**Table 3. Software available in the GI Science for Environmental Management Lab**

<b><u>Software Title</u></b>	<b><u>Licensing</u></b>
All SCL Licenses*	See Table 1
ENVI	1 seat
Menci APS	1 seat
Agisoft Photoscan	2 seats
Trimble Business Center	1 seat
Quick Terrain Modeler	1 seat
Airserver	1 seat
GoToMeeting	1 subscription
MeshLab	Unlimited
Feature Analyst	3 seats

**Table 4. Equipment available in the GI Science for Environmental Management Lab**

<b>Equipment</b>	<b>Details</b>	<b>Functionality</b>
Trimble R10 GNSS	2 x R10 receivers 2x Rover poles 2x TSC3s 1 Base tripod	RTK (4mm horizontal x 6mm vertical accuracy) GNSS
ASD Multispec 4 Standard	1 x 350-2400nm spectrometer Field backpack Pistol Leaf clip Reflectance panel Field Laptop (Lenovo) Viewspect Pro software	Spectroscopy with 2-4nm FWHM
Aviatrix Flight Management System	Ublox GPS Field Laptop (Lenovo) Pilot Screen Flight Planning Software Dual DSLR triggers	GPS based flight planning and camera triggering for manned airborne imaging
Nikon D810 w/50mm lens	36MP RGB 24 x 36mm CMOS 128GB Memory	RGB imaging or HD Video
Nikon D810 NIR w/50mm lens	36MP NGB 24 x 36mm CMOS 128GB Memory	NGB imaging or HD Video
DJI Phantom II	Takeoff weight: <1.3Kg Flight time: 20 min w/ payload	Training/practice flights Demonstrations
DJI M600	Takeoff weight: <15.1Kg Flight time: 18 min w/ payload Payload: up to 6Kg	Imaging with SDLRs and Thermal sensors
Balloon Photography Rig	Helium based Payload: compact consumer camera	Imaging small areas at high spatial resolutions
Cannon sx260 (2)	12.1MP RGB 6.17x4.55mm CMOS 16GB Memory	GPS tagged enable RGB imaging

**Server Infrastructure**

GES Operates a small server room equipped with a 24U rack, 3750W UPS, and portable air conditioner. The server room, located in Bandelier East 106A, is monitored for temperature and humidity remotely with both automatic cutoff and remote user based shutdown. The rack is powered through a 208V L6-30P port, and connected via CAT6 (i.e., 1Gb/s) through a 1Gb/s rack mounted switch connected to the central CAT5 (i.e., 100Mb/s) building network.

**Table 5. GES Server Infrastructure**

Server Name	CPU's	RAM	Storage	Model	Services
New Mexico	4 x 2.01 Ghz 2 x 2C	32GB	306GB		- License Manager
Bosque	12 x 2.0 Ghz 2 x Intel Zeon E5-2620, 6C, 15M Cache, 7.2GT/s QPI, Turbo, 6C, 95W	32GB 8 x 4GB, 1333 MT/s, X8 Data width	32TB 8 x 4TB 7.2K RPM , SATA 3Gbps, Configured RAID 6	Dell PowerEdge R720	- Storage - Backup License Manager Host
Road Runner	12 x 1.9Ghz 2 x Intel Xeon E5-2420, 6C, 15M Cache, 7.2GT/s QPI, Turbo, 95W	96 GB 6 x 16GB, 1333 MT/s, X4 Data width	600GB 2 x 600GB 15K RPM SAS 6Gbps, configured Raid "0"	Dell PowerEdge R420	- GEM Lab VM Host - GEM Lab Website
Spectral	12 x 2.1Ghz 2x Xeon® E5- 2620 v2, 6C, 15M Cache	80GB 4x 16GB + 4x4GB 1866MHz DDR3 ECC + 2 x 2GB K2000 GPU's	4.256 TB 1 x 256GB Solid State 1 x 4TB 7.2k RPM SATA, 3 GB/s	Dell T5610	-Structure-from- Motion Processing -LIDAR Processing

## Criterion 8. Program Comparisons

*The programs within the unit are of sufficient quality compared to relevant peers. (Differentiate by program where appropriate.)*

**8A. Provide information on the distinguishing characteristics of the programs within the unit (please use the template provided as Appendix G as a guide). Discuss the unit’s programs in comparison with other programs such as number of faculty, student characteristics, curricula, and types of programs:**

- **Parallel programs at any of our 22 peer institutions. <http://oia.unm.edu/miscellaneous/unm-peer-institutions.html>**
- **Parallel programs at other peer institutions identified by the unit.**
- **Regional and national comparisons of academic programs.**

Peer programs were generally determined to be Masters level graduate programs, with between 8-15 faculty and R1 research status. The exception was University of North Texas, whose doctoral program is relatively small and just getting started and University of Colorado Denver, which is an R2 but has a much larger graduate program. We categorized programs with PhDs as aspirational peers when we determined that, based on faculty size and number of students, etc., we could reasonably see them as peers in the next ten years. Programs with a large number of faculty and/or those with “School” status (rather than “Department”) were not considered peers based on size of program and associated resources. We then looked beyond the list of 22 identified peers to determine other possible peer institutions based on faculty and program area. Because of the relatively small size of our department and current lack of a PhD program, few of the 22 UNM identified peers institutions were appropriate. Only three departments – New Mexico State U., U Colorado Denver, and U. Missouri, Columbia – were identified as similar based on enrollments and size of faculty.

Institution	How similar is your program to the peer institution’s program in terms of overall organization?	Would you consider them to be an aspirational peer (Y/N)?	Department Name	# of Faculty	Degrees	Students in Residence Sp 2015:	Carnegie Class	Other
<b>Geography programs from list of UNM’s 22 peer institutions</b>								
<b>University of New Mexico</b>	Self	self	Department of Geography and Environmental Studies	10	BA, BS, MS	66 Majors, 24 Masters	R1	
<b>Arizona State University</b>	Very Dissimilar	No	School of Geographical Sciences and Urban Planning	39	B.A., B.S., B.S.P., M.A., M.A.S., M.U.E.P., M.U.E.P. 4+1, Ph.D. in Geography and Ph.D. in Planning	410 Undergraduate, 141 Graduate	R1	

Institution	How similar is your program to the peer institution's program in terms of overall organization?	Would you consider them to be an aspirational peer (Y/N)?	Department Name	# of Faculty	Degrees	Students in Residence Sp 2015:	Carnegie Class	Other
<b>Florida International University</b>	Very Dissimilar	No	Department of Global and Sociocultural Studies	32	24 (Geography B.A.); 295 (Sociology/Anthropology); 3 (GSS M.A.); 61 (GSS Ph.D.)	24 (Geography B.A.); 295 (Sociology/Anthropology); 3 (GSS M.A.); 61 (GSS Ph.D.)	R1	
<b>New Mexico State University</b>	Similar	Yes	Department of Geography	7	B.S., M.S.	Data not available.	R2	
<b>Texas A&amp;M University</b>	Somewhat Dissimilar	Aspirational peer	Department of Geography	21 (full and part time)	B.S. Geography, B.S. Geographic Information Science and Technology, B.S. Environmental Studies, B.S. Spatial Sciences, M.S., Ph.D.	65 Bachelors, 10 Masters, 5 Ph.D.	R1	
<b>Texas State U., San Marcos</b>	Very Dissimilar	No	Department of Geography	42	B.A., B.S. in Geography; B.S. in Resource and Environmental Studies, Geographic Information Science, Physical Geography, Water Studies, Urban and Regional Planning; Certificates in GIS, Location Analysis, Environmental Interpretation, and Water Resources Policy; Master of Applied Geography (M.A.G.); Master of Science in Geography (M.S.); Ph.D. in Geography, Ph.D. in Geographic Information Science, and Ph.D. in Geographic Education.	185 Bachelors, 8 Masters, 14 Ph.D.	R2	

Institution	How similar is your program to the peer institution's program in terms of overall organization?	Would you consider them to be an aspirational peer (Y/N)?	Department Name	# of Faculty	Degrees	Students in Residence Sp 2015:	Carnegie Class	Other
<b>Texas Tech. U.</b>	Very Dissimilar	Yes	Department of Geosciences	10	BA (Geography), MS (Geography), PhD (Geosciences)	50 Undergraduate, 12 Masters, 4 PhD	R1	Physical Geography Focus
<b>U. Texas, Arlington</b>	Very Dissimilar	No	No program-- courses but no department?	n/a	n/a	n/a	n/a	
<b>U. Texas, Austin</b>	Somewhat Dissimilar	Aspirational Peer	Department of Geography and the Environment	16	B.A., M.A., Ph.D.	88 Bachelors, 1 Masters, 3 Ph.D.	R2	
<b>U. Texas, El Paso</b>	Very Dissimilar	No	Department of Geologic Sciences	n/a	Minor in Geography only	n/a	n/a	
<b>U. Arizona</b>	Very Dissimilar	No	School of Geography and Development	43	B.A., B.S., M.A., M.S., M.S.GIST, MDP, Ph.D.	351 Undergraduate Majors, 11 MA, 50 MS, 25 MDP, 51 Ph.D.	R1	
<b>U. California, Riverside</b>	Very Dissimilar	No	No program— Department of Earth Science (like our EPS)	n/a	n/a	n/a	n/a	
<b>U. Colorado, Boulder</b>	Somewhat Dissimilar	Aspirational Peer	Department of Geography	23	B.A., M.A., Ph.D.	165 Majors, 17 Masters, 59 Ph.D.	R1	
<b>U. Colorado, Denver</b>	Similar	Yes	Department of Geography and Environmental Sciences	17	B.A. in Geography, 14 M.S. in E.S.	184 Majors, 81 Masters	R2	
<b>U. Houston</b>	Very Dissimilar	No	Department of Earth and Atmospheric Sciences	n/a	GIS Certificate but otherwise Geology/Geophysics	n/a	n/a	
<b>U. Iowa</b>	Somewhat Dissimilar	Aspirational peer	Department of Geographical and Sustainability Sciences	12	B.A., B.S., M.A., Ph.D.	51 Majors, 6 Masters, 12 Ph.D.	R1	

Institution	How similar is your program to the peer institution's program in terms of overall organization?	Would you consider them to be an aspirational peer (Y/N)?	Department Name	# of Faculty	Degrees	Students in Residence Sp 2015:	Carnegie Class	Other
<b>U. Kansas</b>	Somewhat Dissimilar	Aspirational peer	Department of Geography and Atmospheric Science	15	B.A., B.S., B.G.S., M.A., M.S., Ph.D.	24 Bachelors, 13 Masters, 13 Ph.D.	R1	
<b>U. Missouri, Columbia</b>	Similar	Peer	Department of Geography and Geographic Resources Center	9	B.A., M.A.	51 Majors, 13 Masters	R1	
<b>U. Nebraska, Lincoln</b>	Somewhat Dissimilar	Aspirational peer	Geography and Spatial Science	17	BA, BS, MA, PhD	37 Majors, 16 Masters, 12 PhD	R1	
<b>U. Nevada Las Vegas</b>	Very Dissimilar	No	Department of Geoscience	n/a	B.S. in Geology, PhD in Geoscience	n/a	n/a	
<b>U. Oklahoma, Norman</b>	Somewhat Dissimilar	Aspirational Peer	Department of Geography and Environmental Sustainability	20	B.A., B.S., M.A., Ph.D. in Geography; B.A., B.S. in GIS; and B.A., B.S., M.S. in Environmental Sustainability, Graduate Certificate in Geospatial Information Technologies.	234 Bachelors, 18 Masters, 22 Ph.D.	R1	
<b>U. Utah</b>	Somewhat Dissimilar	Aspirational Peer	Department of Geography	16	B.A., B.S., M.A., M.S., Ph.D. (Geography); Geographic Information Science M.S.	79 Bachelors, 32 Masters, 13 Doctoral	R1	

Beyond the list of 22 UNM peers, we added Ball State U., Ohio U., San Francisco State U., U. Louisville, U. Montana, U. Nebraska-Omaha, U., North Texas, U. Wyoming as peer institutions based on our criteria. The following table shows characteristics of all programs thus identified as peers.

Institution	How similar is your program to the peer institution's program in terms of overall organization?	Would you consider them to be an aspirational peer (Y/N)?	Department Name	# of Faculty	Degrees	Students in Residence Sp 2015:	Carnegie Class
<b>University of New Mexico</b>	self	self	Department of Geography and Environmental Studies	10	BA, BS, MS	66 BA/BS 24 MS	R1
<b>Ball State U.</b>	Similar	Peer	Department of Geography	13	BA/BS in Geography; MS in GIScience or Applied Atmospheric Sciences	n/a	R2
<b>Denver U.</b>	Somewhat similar	Aspirational peer	Department of Geography and the Environment	15	BA, MA, PhD in Geography; MS in GIScience; BA/BS in Environmental Science	66 BA/BS 14 MA/MS 9 PhD	R2
<b>Miami U. of Ohio</b>	Similar	Peer	Department of Geography	16	Certificate in GIScience; A.B. in Geography; A.B. in Urban and Regional Planning; M.A. in Geography	69 undergrad 12 MA	R2
<b>New Mexico State University</b>	Similar	Peer	Department of Geography	7	B.S., M.S.	Data not available	R2
<b>Ohio U.</b>	Similar	Peer	Department of Geography	15	BA, BS, MA, MS in Geography	127 BA/BS 21 MA	R2
<b>Oklahoma State U.</b>	Dissimilar	Aspirational peer	Department of Geography	18	BA, BS, MS, PhD in Geography; BS in GIScience	36 BA/BS 8 MA/MS 21 PhD	R2
<b>San Diego State U.</b>	Dissimilar	Aspirational peer	Department of Geography	19	BA and BS in geography; MA in geography; MS in GIScience or Watershed Science; PhD in geography	126 BA/BS 45 MA/MS 26 PhD	R2
<b>San Francisco State U.</b>	Similar	Peer	Department of Geography and Environment	13	BA, BS, MA, MS in Geography	142 BA/BS 54 MA/MS	R3



Institution	How similar is your program to the peer institution's program in terms of overall organization?	Would you consider them to be an aspirational peer (Y/N)?	Department Name	# of Faculty	Degrees	Students in Residence Sp 2015:	Carnegie Class
<b>U. Colorado, Denver</b>	Similar	Peer	Department of Geography and Environmental Sciences	17	B.A. in Geography, 14 M.S. in E.S.	184 BA 81 MS	R2
<b>U. Louisville</b>	Similar	Peer	Department of Geography and Geosciences	12	BS, MS in Applied Geography	128 BA	R1
<b>U. Missouri, Columbia</b>	Similar	Peer	Department of Geography and Geographic Resources Center	9	B.A., M.A.	51 BA 13 MA	R1
<b>U. Montana</b>	Similar	Peer	Department of Geography	10	BA, BS, MA, MS in Geography	62 BA/BS 15 MA/MS	R2
<b>U. Nebraska, Omaha</b>	Similar	Peer	Department of Geography–Geology	11	BA, BS, MA in Geography	25 BA/BS 8 MA	R3
<b>U. North Texas</b>	Similar	Peer	Department of Geography and the Environment	15	BA, BS, MS in Geography; PhD Environmental Science	118 BA/BS 33 MA	R1
<b>U. Wyoming</b>	Similar	Peer	Department of Geography	10	BA, BS, MA in Geography; MST; MP in Planning	56 BA/BS 3 graduate	R2

Compared to this group, GES has a higher research profile than most programs but is on the low-average end of the range for total number of undergraduate majors. Our current faculty size puts us more in line with the average range for this group – an important change since the time we completed our previous APR – but we are still small in comparison to most programs. We offer a standard suite of degree offerings and our MS program enrollments are very robust, given our faculty size.

## Criterion 9. Future Direction

*The unit engages in strategic planning and prioritization in order to achieve its mission and vision.*

### **9A. Provide a summary of strengths and challenges for the unit.**

#### Strengths

GES offers an outstanding graduate program and has a productive faculty with a growing research profile. As financial resources have grown in the last few years, they have been leveraged wisely to support students, improve visibility (on campus and regionally/nationally), and update infrastructure. The Department continues to enjoy an extremely collegial environment and has restructured its governance model to take advantage of increased faculty size.

#### Challenges

Despite growth, the GES faculty size is still relatively small, which results in heavy service and administrative loads for individual faculty whose energy is also needed for strategic improvements in research and teaching. Future growth in undergraduate enrollment and majors is critical, given uncertainty regarding the UNM budget model that leaves GES vulnerable as a small department. And finally, we are outgrowing our facilities.

### **9B. Describe the unit's strategic planning efforts.**

Each August, GES faculty meet for a strategic planning retreat led by the Department Chair. In general, retreat agendas include: presentation/discussion of the previous year's annual report, group discussion of overall strategic plans, prioritization of initiatives for the coming year, and focused work on one or two planning tasks.

After the retreat, a list of the year's strategic priorities is circulated to faculty and is used to guide administrative assignments, committee charges, and faculty meeting agendas throughout the year.

At the end of each academic year, the Chair updates the most recent APR Action Plan and prepares a year-in-review presentation for the Advisory Board, where feedback is collected to share with faculty at the next year's planning retreat.

Long-term strategic planning is discussed each year in a general way, but comprehensive plans are prepared only about every 5 years (in conjunction with the APR schedule).

### **9C. Describe the strategic directions and priorities for the unit.**

In summer and fall of 2016, GES faculty engaged in a comprehensive long-term strategic planning process. The resulting list of initiatives is organized here by area and by timeline, where appropriate.

#### PRIORITY: SCHOLARLY EXCELLENCE

Vision: Our vision is to be nationally recognized for excellence in relevant scholarship and to be recognized regionally and at UNM as a center for interdisciplinary research.

#### Strategies:

- Provide support to help faculty raise and maintain excellent scholarly profiles, as measured by Associate Professors achieving advancement to full professor in no more than 7 years.
  - Adjustment of teaching loads, formats, support
  - Travel funds
  - Research incentive/support funds
- Promote and reinforce standing as center of excellence for interdisciplinary science at UNM
  - Promote internal cooperation on research.
  - Incentivize service and research activities focused on interdisciplinary science.

#### PRIORITY: UNDERGRADUATE PROGRAM

Vision: Our vision is to provide robust undergraduate curricula that prepare students to achieve their goals in research, further education, and their chosen careers.

#### Strategies:

- Next 2 years: Help students achieve undergraduate degrees efficiently
  - Improve sequential scheduling of classes
  - Explore innovative teaching formats (e.g. hybrid, compressed)
- Next 2 years: Maximize course enrollments in ways that are pedagogically responsible.
- Next 5 years: Evaluate curriculum again in light of enrollments.
- Next 5 years: Create a staff position for undergrad advising, so as to separate the faculty program director role and allow for a strategic focus
- Next 5 years: Add an Environmental Studies undergrad program, in conjunction with a review of existing curricula
- Next 10 years: Increase the number of combined majors in BA and BS to 100.
  - Increase recruitment of freshmen as geography majors
  - Expand student recruitment to include lifelong learners

#### PRIORITY: AUGMENTATION OF FACILITIES

Vision: We envision modernizing and updating our computing and teaching facilities to support excellence in student learning and research.

#### Strategies:

- Next year: Renovate BAW104.
- Next 2 years: Update the Spatial Computing Lab infrastructure.
- Next 5 years: Update and expand space for graduate student research.
- Next 5 years: Expand computing facilities to accommodate open-access and grad research

- lab facilities that are separate from the teaching lab
- Next 5 years: Establish access to physical geography wet lab space.
- Next 10 years: Comprehensively renovate and remodel Bandelier West/East.

#### PRIORITY: GRADAUTE PROGRAM

Vision: We will increase the quality and depth of our overall graduate program offerings.

#### Strategies:

- Next year: Add GIScience certificate program in Spatial Entrepreneurship.
- Next 5 years: Increase quality of MS program—increase number of applicants, TA/RA support, draw outstanding graduates to support faculty research.
- Next 5 years: Add PhD program, in conjunction with NMSU, with modifications to the proposal/structure as makes strategic sense
- Next 10 years: Explore collaborative programming opportunities with CRP, WRP, Latin American Studies

#### PRIORITY: TEACHING EXCELLENCE

Vision: We will continue to be a campus leader in teaching innovation and lifelong learning

#### Strategies:

- Next 5 years: Expand student opportunities for experiential Learning
  - addition of new field-bases courses and field components to existing courses
  - addition of study abroad options
  - Provide vehicle access for field activities (courses, research)
  - Expand our range of instruction formats
- Next 10 years: Continued improvement in teaching effectiveness and quality, as measured by assessments and evaluations
  - Increase TA support for large-enrollment courses
  - Explore innovative teaching formats (hybrid, compressed, etc.)
  - Attend teaching workshops to improve pedagogical skills
  - Incorporate culturally inclusive teaching strategies

#### PRIORITY: SERVICE AND ADMINISTRATIVE LOAD MANAGEMENT

- Next 2 years: Develop workload mgmt. plan that explicitly affords pre-tenure protection
- Next 2 years: Increase efficiency in administrative tasks
- Next 5 years: Incentivize faculty participation in strategic UNM positions for department impact and exposure
- Next 5 years: Increase national/international service profile in professional organizations
- Next 5 years: Add staff in order to reduce non-academic service loads on faculty at all levels

#### PRIORITY: OUTREACH

- Next year: Develop an alumni outreach plan to include an alumni network
- Next year: Develop strategy for using faculty websites for outreach
- Next 2 years: Develop a Diversity Plan to guide recruitment, retention, and hiring initiatives for students, faculty, and staff
- Next 5 years: Develop a GIScience support center for UNM campus
- Next 5 years: Increase submission for outreach/development grants to nontraditional GES populations
- Next 5 years: Increase research cooperation external to UNM
- Next 5 years: Engage in cross-institutional outreach (e.g. with NMSU and other schools)
- Next 5 years: Develop a social media strategy and infrastructure to support it
- Next 10 years: K-12 outreach to lead into freshmen recruitment
- Next 10 years: Engage in broader public outreach, development and fundraising

#### PRIORITY: RESOURCES DEVELOPMENT

- Next 2 years: Establish center(s) to increase dept. share of F&A return
- Next 2 years: Increase proposal submission rates
- Next 5 years: Increase external research funding
- Next 5 years: Add new person(nel) to handle accounting and research compliance
- Next 5 years: Add new staff person to support PhD program
- Next 5 years: Initiate self-funding, revenue-generating programs

# Appendix A

## Appendix A: Courses Offered in the Department of GES (from the official UNM Catalog)

### [GEOG 101. Home Planet: Land, Water and Life \[Physical Geography\]. \(3\)](#)

World geography; physical elements. Use of maps and globes for a systematic analysis of world climates, vegetation, soils and landforms and their distribution, interrelation and significance to humans. Meets New Mexico Lower-Division General Education Common Core Curriculum Area III: Science.

### [GEOG 102. People and Place \[Human Geography\]. \(3\)](#)

World geography; human elements. A systematic analysis of world population, demographic factors, ethnic groups, predominant economies and political units and their distribution, interrelation and interaction with the physical earth. Meets New Mexico Lower-Division General Education Common Core Curriculum Area IV: Social/Behavioral Sciences (NMCCN 1213).

### [GEOG 105L. Home Planet: Land, Water and Life Laboratory \[Physical Geography Laboratory\]. \(1\)](#)

Exercises designed to complement 101. Applied problems in the spatial processes of the physical environment. Map construction and reading, weather and climatic analysis, classification of vegetative and soil associations, landform distribution analysis. Two hours lab. Meets New Mexico Lower-Division General Education Common Core Curriculum Area III: Science.

Pre- or corequisite: 101.

### [GEOG 140. Introduction to World Regions \[World Regional Geography\]. \(3\)](#)

The regional geography of the world. Both physical and human aspects are studied along with current economic and political problems.

### [GEOG 180. The World of Beer. \(3\)](#)

This course examines the complex and fascinating world of beer. It examines social and ecological influences on its development and explores the functions of beer from historical, economic, cultural, environmental and physical viewpoints.

### [GEOG 195. Introduction to Environmental Studies \[Humans Role in Changing the Face of the Earth\]. \(3\)](#)

Survey of environmental issues related to the degradation of land, air and water resources.

### [GEOG 217. Energy, Environment and Society. \(3\)](#)

(Also offered as ME 217)

A look at the social, ethical, and environmental impacts of energy use both now and through history. A survey of renewable energy and conservation and their impact on environmental and social systems.

### [GEOG 251. Meteorology. \(3\)](#)

(Also offered as EPS 251)

Description of weather phenomena, principles of atmospheric motion, weather map analysis and weather prediction.

### [GEOG 281. Introduction to Maps and Geospatial Information. \(3\)](#)

Maps are tools for communication. Will explore scale; projections; symbolization; generalization; alternative or non-tradition map representations provided by GIS, remote sensing, multimedia and animated maps.

### [GEOG 350. Natural Environments \[Physical Landscapes\]. \(3\)](#)

This course examines the biophysical processes that produce distinctive landscapes in polar, temperate, tropical, and alpine environments, by analyzing interactions between climate, vegetation, soils, landforms, geology, and human activities.

Prerequisite: 101 and 105L.

### [GEOG 352. Global Climate Change. \(3\)](#)

(Also offered as EPS 352)

Comparison of natural and anthropogenic causes of large-scale climate change. Factors influencing development of mitigation of adaptation policies.

**GEOG \*\*360. Land Use Management.** (3)

Exercise of legal and political power over land and other resources. Resolution of conflicts between competing land users.

**GEOG 363. Economic Geography.** (3)

A systematic analysis of spatial economic patterns. Introduction to models of economic space and theories of spatial economic interaction. Analysis of effects of resource attributes and distributions upon economic activities. Examination of cultural-economic regions.

**GEOG 364. Law, Place and Space [Law and Geography].** (3)

This class examines the relationships between law and geography, interrogating how law shapes the human experience of place, and the ways that a variety of spatial categories inform the law.

**GEOG 365. Nature and Society.** (3)

This course explores the human dimensions of geographical challenges through the traditions, actions and social organization of contemporary western and global/international human systems.

**GEOG 380L. Basic Statistics for Geographers.** (3)

Introduces fundamental statistical and quantitative modeling techniques widely used in geography. Emphasizes geographic examples and spatial problems. Includes a lab component that covers the use of statistical software in geographic analysis. Fee required.

**GEOG \*\*381L. Introduction to Geographic Information Systems.** (4)

The study of spatial data, spatial processes and an introduction to the computer tools necessary to analyze spatial representations of the real world. Exercises in data acquisition, preprocessing, map analysis and map output. Fees required. Three hours lecture, 2 hours lab.

**GEOG 427 / 527. Introductory Programming for GIS.** (3)

This course is intended to provide GIS software users with an introduction to Python, the de facto programming language of the GIS community.

Prerequisite: \*\*381L.

**GEOG 428 / 528. Advanced Programming for GIS.** (3)

This course is intended to provide advanced GIS software programming experience, with an emphasis on the creation of standalone, distributable programs in Python, the de facto programming language of the GIS community.

Prerequisite: 427.

**GEOG \*445. Geography of New Mexico and the Southwest.** (3)

This course introduces the geography of the Southwest, focusing on New Mexico. Students will conduct independent research in conjunction with a multi-day field trip.

**GEOG \*450. Environmental Hazards.** (3)

This course provides an introduction to environmental hazards including drought, floods, earthquakes, wildfire, and hurricanes. Geographic technologies used to map, model, analyze, and manage hazards are discussed. Disturbances related to human-environment interactions are covered.

**GEOG 461 / 561. Environmental Management.** (3)

Examination of critical issues of environmental degradation in global and local system related to: air and water pollution, soil erosion, deforestation, strip mining, over dependence on fossil fuels and improper management of toxic and other wastes. Appraisal of the conservation methods and policies applied to these issues and the outlook for the future.

**GEOG 462 / 562. Water Resources Management.** (3)

An examination of the problems and trends in the use of water resources in the United States, with emphasis on the physical and social aspects related to its management.



**[GEOG 463 / 563. Public Land Management.](#) (3)**

Defining public and private rights associated with managing natural resources is the key to many of the current controversies concerning the environment. This course looks at public land policy and policy related to other common property resources such as water, the oceans, and the coastal zone.

**[GEOG 464 / 564. Food and Natural Resources.](#) (3)**

Students gain an advanced introduction to the social and environmental effects of individual food choices, through the analysis of the sociocultural and biophysical relationships embedded in various agricultural and food production systems.

**[GEOG 466 / 566. The City \[The City as Human Environment\].](#) (3)**

This class examines the vectors of difference - cultural, economic, political, legal and environmental - that animate urban form and life. Class involves fieldwork.

**[GEOG 467 / 567. Governing the Global Environment.](#) (3)**

The role of global and regional governmental and non-governmental organizations in environmental politics, and the process of their formation and change in response to environmental problems.

**[GEOG 471. Senior Geography Capstone.](#) (3)**

Students examine how geographic knowledge may be applied beyond academia, through discussion of key ideas in geography, personal values, and career goals. Students gain practical experience preparing for professional careers. Restriction: senior standing.

**[GEOG \\*481L. Map Design and Geovisualization.](#) (4)**

Thematic mapping of qualitative and quantitative data, including graphic design theory and appropriate statistical and representational treatment of geospatial data. Fees required. Two hours lecture, four hours lab. Prerequisite: 281.

**[GEOG 483L / 583L. Remote Sensing Fundamentals.](#) (4)**

Introduces the concepts of remote sensing of the Earth, sensors and photographic systems used, and the basic processing and analysis required to bring the imagery into GIS. Includes a lab component. Fee required. Prerequisite: \*\*381L.

**[GEOG 484L / 584L. Applications of Remote Sensing.](#) (4)**

Explores the utilization of remote sensing imagery through advanced processing and analysis. Covers the integration of imagery into specific research areas, including biological, geological, urban and hydrological analysis. Includes a lab component. Fee required. Prerequisite: 483L.

**[GEOG 485L / 585L. Internet Mapping.](#) (3)**

Current and emerging approaches to internet mapping, including geospatial interoperability standards, technologies, and capabilities. Includes a lab component that covers the use of various types of software and applications. Fee required. Prerequisite: \*\*381L.

**[GEOG 486L / 586L. Applications of GIS.](#) (3)**

Selected applications of Geographic Information Systems, including anthropology, business, crime, ecology, engineering, health, planning, water resources and others. Covers analytical techniques specific to selected applications. Fee required. Prerequisite: \*\*381L.

**[GEOG 487L / 587L. Spatial Analysis and Modeling.](#) (3)**

Spatial analysis and modeling techniques using Geographic Information Systems. Includes a lab component that covers the use of GIS and other software to carry out analysis projects. Fee required. Prerequisite: \*\*381L.

**[GEOG 488L / 588L. GIS Concepts and Techniques.](#) (3)**

Selected advanced concepts and techniques in Geographic Information Systems. Includes a lab component that provides students with the opportunity to apply concepts and techniques in a hands-on manner. Fee required. Prerequisite: \*\*381L.

**[GEOG 491. Problems.](#) (1-3 to a maximum of 3 Δ)**

Supervised individual study and field work. Must be taken for 6 credit hours in the Honors program.

**[GEOG 493. Internship in Applied Geography.](#) (1-3 to a maximum of 3 Δ)**

Written field analysis of a project coordinated between student, faculty and public or private manager. Credits to be determined by supervising faculty.

**[GEOG \\*499. Topics in Geography.](#) (1-3 to a maximum of 6 Δ)**

Specific topics in geography which relate contemporary issues to the discipline. Topics will be noted in the appropriate schedule of classes. Credit can be applied by majors to the appropriate department group requirements for the degree.

**[GEOG 501. Geographic History and Methods.](#) (3)**

Examines, evaluates, and criticizes the methods geographers have used to analyze the reciprocal relationship between humankind and the environment.

**[GEOG 502. Approaches to Geographical Research.](#) (3)**

Introduces the basic elements of research design and proposal writing, focusing on examples from current geographic research.

Prerequisite: 501.

**[GEOG 514. Natural Resources Management Seminar.](#) (3 to a maximum of 6 Δ)**

This course explores the interdisciplinary nature of natural resource challenges. Topics will vary each semester. Field trips will be included to investigate issues relevant to the class.

**[GEOG 515. Cultural and Political Ecology.](#) (3)**

This seminar examines case studies and recent geographical scholarship in cultural and political ecology, focusing on its relevance for resource managers and institutions.

**[GEOG 516. Seminar: Globalization.](#) (3)**

This seminar examines the political, cultural, and economic facets of globalization, focusing on contemporary theories of neoliberalism and post-colonialism.

**[GEOG 517. Legal Geography \[Law and Geography\].](#) (3)**

This class provides an overview of the legal system, the ways law is spatially manifested, and the spatial vectors that animate the law.

**[GEOG 524. Advanced Topics in Remote Sensing.](#) (3)**

This course provides graduate students with the opportunity to explore theoretical, technical and applied advancements in remote sensing as a tool for monitoring and managing earth resources

Prerequisite: (583L or 483L) and (584L or 484L).

**[GEOG 525. Advanced GIScience Seminar \[Seminar in Geographic Information Science\].](#) (3)**

Examination of current trends in Geographic Information Science, including technical, social, institutional and legal issues. Restriction: permission of instructor.

**[GEOG 527 / 427. Introductory Programming for GIS.](#) (3)**

This course is intended to provide GIS software users with an introduction to Python, the de facto programming language of the GIS community.

Prerequisite: \*\*381L or 581L.

**[GEOG 528 / 428. Advanced Programming for GIS.](#) (3)**

This course is intended to provide advanced GIS software programming experience, with an emphasis on the creation of standalone, distributable programs in Python, the de facto programming language of the GIS community.

Prerequisite: 527 or 427.

**[GEOG 561 / 461. Environmental Management.](#) (3)**

Examination of critical issues of environmental degradation in global and local system related to: air and water pollution, soil erosion, deforestation, strip mining, over dependence on fossil fuels and improper management of toxic and other wastes. Appraisal of the conservation methods and policies applied to these issues and the outlook for the future.

[GEOG 562 / 462. Water Resources Management.](#) (3)

An examination of the problems and trends in the use of water resources in the United States, with emphasis on the physical and social aspects related to its management.

[GEOG 563 / 463. Public Land Management.](#) (3)

Defining public and private rights associated with managing natural resources is the key to many of the current controversies concerning the environment. This course looks at public land policy and policy related to other common property resources such as water, the oceans, and the coastal zone.

[GEOG 564 / 464. Food and Natural Resources.](#) (3)

Students gain an advanced introduction to the social and environmental effects of individual food choices, through the analysis of the sociocultural and biophysical relationships embedded in various agricultural and food production systems.

[GEOG 566 / 466. The City \[The City as Human Environment\].](#) (3)

This class examines the vectors of difference - cultural, economic, political, legal and environmental - that animate urban form and life. Class involves fieldwork.

**[GEOG 567 / 467. Governing the Global Environment.](#) (3)**

The role of global and regional governmental and non-governmental organizations in environmental politics, and the process of their formation and change in response to environmental problems.

**[GEOG 580L. Spatial Statistics \[Quantitative Methods in Geography\].](#) (3)**

Introduces fundamental statistical and quantitative modeling techniques widely used in geography. Emphasizes geographic examples and spatial problems. Includes a lab component that covers the use of statistical software in geographic analysis. Fee required.

**[GEOG 581L. Introduction to GIS for Graduate Students \[Fundamentals of GIS\].](#) (3)**

Introduces the concepts underlying Geographic Information Systems and its utilization for the input, storage, manipulation, query, display, and analysis of geographical data. Includes a lab component that covers the range of analytical techniques available in current software. Fee required.

**[GEOG 583L / 483L. Remote Sensing Fundamentals.](#) (4)**

Introduces the concepts of remote sensing of the Earth, sensors and photographic systems used, and the basic processing and analysis required to bring the imagery into GIS. Includes a lab component. Fee required.

Prerequisite: \*\*381L or 581L.

**[GEOG 584L / 484L. Applications of Remote Sensing.](#) (4)**

Explores the utilization of remote sensing imagery through advanced processing and analysis. Covers the integration of imagery into specific research areas, including biological, geological, urban and hydrological analysis. Includes a lab component. Fee required.

Prerequisite: 483L or 583L.

**[GEOG 585L / 485L. Internet Mapping.](#) (3)**

Current and emerging approaches to internet mapping, including geospatial interoperability standards, technologies, and capabilities. Includes a lab component that covers the use of various types of software and applications. Fee required.

Prerequisite: \*\*381L or 581L.

**[GEOG 586L / 486L. Applications of GIS.](#) (3)**

Selected applications of Geographic Information Systems, including anthropology, business, crime, ecology, engineering, health, planning, water resources and others. Covers analytical techniques specific to selected applications. Fee required.

Prerequisite: \*\*381L or 581L.

**[GEOG 587L / 487L. Spatial Analysis and Modeling.](#) (3)**

Spatial analysis and modeling techniques using Geographic Information Systems. Includes a lab component that covers the use of GIS and other software to carry out analysis projects. Fee required.

Prerequisite: \*\*381L or 581L.

**[GEOG 588L / 488L. GIS Concepts and Techniques.](#) (3)**

Selected advanced concepts and techniques in Geographic Information Systems. Includes a lab component that provides students with the opportunity to apply concepts and techniques in a hands-on manner. Fee required.

Prerequisite: \*\*381L or 581L.

**[GEOG 591. Problems.](#) (1-3 to a maximum of 3 Δ)**

Supervised individual study and field work.

**[GEOG 593. Internship in Applied Geography.](#) (1-3 to a maximum of 3 Δ)**

Written field analysis of a project coordinated between student, faculty and public or private manager. Credits to be determined by supervising faculty.

**[GEOG 597. Master's Project.](#) (3)**

Development of an advanced project in geographical research under the supervision of a graduate committee. A grade of CR is earned if the project is approved by faculty committee.

**Offered on a CR/NC basis only.**

Prerequisite: 501 and 502.

Restriction: permission of instructor.

[GEOG 599](#). [Master's Thesis](#). (1-6, no limit Δ)  
Offered on a CR/NC basis only.

# Appendix B

## Appendix B: Assessment Instrument for GEOG471 Capstone

- Which of the following identifies a location on the Earth's surface most precisely?
  - Miami
  - 700 miles north of the Gulf of Mexico
  - Dade County, Florida
  - 36° 55' N, 95° 45' W
  - East three blocks and atop a long hill
  
- For each of the following geographic features, decide whether the feature would be best represented as a point, line, or polygon on a map of the continental United States:
 

Oklahoma	A. Point	B. Line	C. Polygon
Gillette, Wyoming	A. Point	B. Line	C. Polygon
U.S. Highway 285	A. Point	B. Line	C. Polygon
The Great Basin	A. Point	B. Line	C. Polygon
The Rocky Mountains	A. Point	B. Line	C. Polygon
Range of the American Bison	A. Point	B. Line	C. Polygon
200 miles south of the Canadian Border	A. Point	B. Line	C. Polygon
A building	A. Point	B. Line	C. Polygon
  
- Indicate whether each of the following statements are true or false:
 

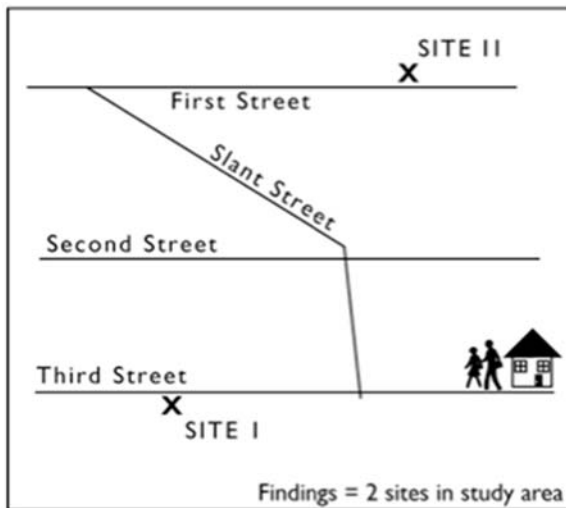
Line symbols can be used on maps to represent areas.  
   True    False

All geographic features can be represented as points, lines, polygons, or surfaces.  
   True    False

Maps distort reality only if the cartographer chooses an incorrect type of symbol for representing a given feature.  
   True    False

Many features commonly represented as lines on maps are actually areas.  
   True    False

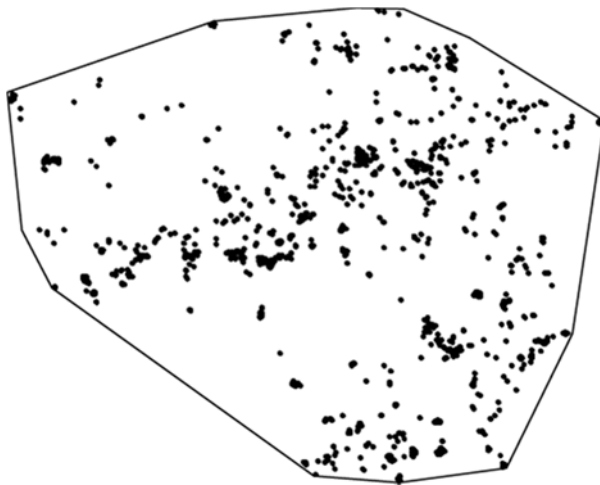
Although point symbols are common on maps, few geographic features are truly points.  
   True    False



- Consider the diagram above, which shows the location of a large apartment complex (represented by the building and people), and the location of two comparable supermarkets within a study area. The study is

intended to assess the effect of distance to supermarket on the shopping behavior of people who do not own an automobile.

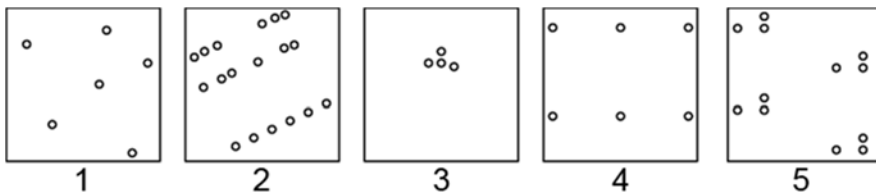
- 4a. If the door of the building symbol represents the precise location of the apartment complex, which of the following statements is most accurate?
- A. The sites are equally distant from the apartment complex.
  - B. Site 1 is closer to the apartment complex.
  - C. Identifying the closest site depends upon how 'distance' is defined.
  - D. Site 11 is closer to the apartment complex.
  - E. There may be another supermarket nearby that is not on the map.
- 4b. Some residents of the apartment complex hire taxis to make weekly grocery-shopping trips. Which supermarket would you expect these taxi travelers to prefer, in order to minimize transport costs?
- A. Site 1
  - B. Site 11
- 4c. One resident who travels exclusively by foot reported that she works at the corner of Slant Street and First Street, and normally buys groceries during her lunch hour at work. Which supermarket is more accessible to her based on her normal shopping behavior?
- A. Site 1
  - B. Site 11
5. You are compiling a list of birds that you expect to find in a national park, using information published about other locations. Which of the following locations would you expect to be most similar to the park in terms of the birds present?
- A. Location A, 25 miles from the park
  - B. Location B, 50 miles from the park
  - C. Location C, 75 miles from the park
  - D. Location D, 100 miles from the park
  - E. Location E, 125 miles from the park



6. Consider the diagram above, which shows the location of trees within a study area. What is the best description of the distribution pattern of these trees?
- A. apparently random
  - B. evenly dispersed
  - C. mostly uniform
  - D. frequently clustered
  - E. entirely chaotic



7. Consider the diagram above, which shows the location of trees within a study area. What is the name of a method you could use to study the distribution of these trees?
- statistical distribution analysis
  - similarity analysis
  - chi-squared analysis
  - map analysis
  - point-pattern analysis
8. Consider the diagram above, which shows the location of trees within a study area. If you believed that human settlement history affected the distribution of these trees, what data would you need to test your hypothesis?
- The location of the nearest tree nurseries
  - A description of past and present land ownership laws
  - The locations of abandoned and occupied settlement sites
  - An explanation of the tree's biogeographic origin
  - The approximate age of the trees
9. Many people in Country A want to emigrate. For each of the following factors, decide whether the factor would likely encourage or discourage migration from Country A to Country B.
- 9a. Country B is near country A  
 A. Encourage      B. Discourage
- 9b. Country B only offers resident visas to highly trained professionals:  
 A. Encourage      B. Discourage
- 9c. Country B has the same official language as Country A:  
 A. Encourage      B. Discourage
- 9d. Few people have ever migrated from Country A to Country B:  
 A. Encourage      B. Discourage



- 10a. Examine the five sets of points represented in the diagram above. Which set has the highest density of points?
- Set 1
  - Set 2
  - Set 3
  - Set 4
  - Set 5

Examine the five sets of points represented in the diagram above. Identify one set that displays the following patterns:

- Clusters of points:
  - Uniform distribution:
  - Linear features:
  - Different patterns at different scales:
11. If your job was to produce a map of cultural regions within a continental area, which of the following factors would be least relevant to your work?
- religion
  - language
  - government
  - ethnicity

- E. population density
12. If your job was to produce a map of climate regions within a continental area, which of the following factors would least help your work?
- precipitation
  - topography
  - rainfall
  - temperature
  - elevation
13. Indicate whether each of the following statements are true or false:
- 13a Adaptive management allows resource managers to change their approach if specific goals are not met.  
True    False
- 13b. One of the biggest challenges about predicting possible impacts of climate change is the difficulty of predicting human behavior.  
True    False
- 13c. Transboundary disputes about resource use exist between neighboring political units, but not between government agencies that have jurisdiction over the same location.  
True    False
- 13d. Successful environmental management is impossible unless the relevant ecological patterns and processes are completely understood.  
True    False
- 13e. Laws controlling behavior have social impacts, but not spatial impacts.  
True    False
14. Label the following features on the world map provided below:
- Atlantic Ocean
  - Arctic Ocean
  - Caribbean Sea
  - Indian Ocean
  - Mediterranean Sea
  - Pacific Ocean
15. Label the following features on the world map provided below:
- Africa
  - Asia
  - Australia
  - Europe
  - North America
  - South America
16. Accurately delimit and label the following vernacular regions on the world map provided below:
- Latin America
  - the Middle East
  - Oceania
  - Southeast Asia
  - Sub-Saharan Africa
  - Western Europe
17. On the world map provided below, draw lines indicating the approximate location of the following features, and label each feature:
- Antarctic Circle
  - Arctic Circle
  - Equator
  - Prime Meridian
  - Tropic of Cancer

Tropic of Capricorn

[For all parallels included in the previous questions.]

Correct ordering of parallels

Incorrect ordering of parallels



# Appendix C

## Appendix C: Assessment Rubrics for B.A. and B.S. Programs

Rubrics for assessing outcomes C, D, and E for the B.S. and B.A. degree programs.

### RUBRIC C: COMPETENCIES IN GEOSPATIAL TOOLS

(B.S. program only)

Program Outcomes	Criteria for Acceptable Performance	Assessment			
		Superior	Good	Acceptable	Not Acceptable
C.1. Students will be able to identify, collect and process digital spatial data using industry-standard tools.	1. Identifies digital spatial data relevant for a topic.				
	2. Collects digital spatial data using appropriate methods.				
	3. Prepares the data correctly for use in spatial analysis.				
C.2. Students will be able to employ appropriate geospatial analysis methods and interpret the results.	1. Identifies appropriate geospatial analysis methods to address a particular question.				
	2. Uses geospatial tools correctly for spatial data analysis and modeling.				
	3. Results are correctly interpreted and limitations are recognized.				

**RUBRIC C: COMPETENCIES IN RELATIONAL UNDERSTANDING**  
(B.A. program only)

Program Outcomes	Criteria for Acceptable Performance	Assessment			
		Superior	Good	Acceptable	Not Acceptable
C.1. Students will be able to analyze human-environment interaction(s) for a specific case and for specified social and/or environmental conditions.	1. Describes relevant issue or problem.				
	2. Identifies relevant data and information sources.				
	3. Uses relevant data and information sources to explain the relevant human-environment interactions.				
C.2. Students will be able to recognize spatial meanings of social and cultural processes.	1. Identifies spatial context of selected issue or problem.				
	2. Conclusions/explanations address relevant spatial context.				

**RUBRIC D: COMPETENCIES IN COMMUNICATION**  
(B.S. and B.A. programs)

Program Outcomes	Criteria for Acceptable Performance	Assessment			
		Superior	Good	Acceptable	Not Acceptable
D.1. Students will be able to communicate clearly and effectively in an oral format.	1. Presentation style is appropriate.				
	2. Presentation includes visual aids appropriate for a geography presentation.				
	3. Presentation is well organized.				
	4. The presentation adheres to the stated time limits without rushing.				
D.2. Students will be able to communicate clearly and effectively in a written format.	1. The report is clearly written.				
	2. The report is well organized.				
	3. Maps and other graphics are easy to read and serve as appropriate illustrations to the text.				
D.3. Students will be able to communicate clearly and effectively in cartographic format.	1. Cartographic representations are created correctly.				
	2. Spatial data is visualized effectively.				

RUBRIC E: COMPETENCIES IN PROFESSIONAL DEVELOPMENT  
(B.S. and B.A. programs)

Program Outcome	Criteria for “Acceptable” Performance	Assessment			
		Superior	Good	Acceptable	Not Acceptable
E.1. Students will be able to prepare an acceptable, entry-level professional résumé.	1. Résumé includes necessary information.				
	2. Format and layout or résumé are appropriate and effective.				
	3. Content of résumé matches job announcement specifications.				



# Appendix D

## Appendix D: Assessment Rubrics for M.S. Program

Rubric for assessing outcomes A, B, C, and D for the M.S. degree program.

Program Outcome	Evaluation Criteria	Assessment			
		Superior	Good	Acceptable	Not Acceptable
A.1. Student will be able to state an original research question appropriate for geographic analysis. <i>Plan I: thesis; Plan II: professional project</i>	1. States an original research question.				
	2. The research question is appropriate for geographic analysis.				
A.2. Student will be able to state how a research project contributes to an existing body of geographic literature. <i>Plan I: thesis; Plan II: professional project</i>	1. Identifies relevant subfields in the literature of geography or other relevant disciplines.				
	2. States about how the research question fits into an existing body of literature.				
	3. Characterizes the potential contribution of the research.				
B.1. Student will be able to design legitimate geographic methodology. <i>Plan I: thesis and/or oral defense; Plan II: professional project and/or oral defense</i>	1. Defines and justifies the study area or scale of analysis.				
	2. Identifies and justifies selection of data sources appropriate to the research question.				
	3. Identifies and justifies selection of analytical methods appropriate to the research question.				
B.2. Student will be able to implement legitimate geographic methodology. <i>Plan I: thesis and/or oral defense; Plan II: professional project and/or oral defense</i>	1. Explains the method(s) and their application(s).				
	2. Methods are applied correctly.				
B.3. Student will be able to explain and assess the results of original geographic research. <i>Plan I: thesis; Plan II: professional project</i>	1. Draws conclusions and supports conclusions with evidence.				
	2. Assesses the limitations of the research and its conclusions.				

Program Outcome	Evaluation Criteria	Assessment			
		Superior	Good	Acceptable	Not Acceptable
<p><i>Students in GIS specialization program track:</i> C.1a. Student will be able to collect, process, analyze, and present spatial data using industry-standard technologies and techniques. <i>Plan I: thesis; Plan II: professional project</i></p>	1. Employs technologies and techniques that remain in active use in professional settings.				
	2. Represents spatial data with appropriate cartography.				
<p><i>Students in Environmental Management specialization program track:</i> C.1b. Student will be able to analyze human-environment interaction(s) for a specific case and for specified social and/or environmental conditions. <i>Plan I: thesis; Plan II: professional project</i></p>	1. Identifies relevant human-environment interaction(s).				
	2. Identifies possible social and/or environmental causes and effects of relevant interaction(s).				
	3. Assesses the significance of possible effects.				
<p>D.1. Student will be able to communicate clearly and effectively in a written format. <i>Plan I: thesis; Plan II: professional project</i></p>	1. Writing has a limited number of mechanical errors.				
	2. Meaning of sentences can generally be grasped on a single reading.				
	3. Structure is organized in a logical way.				
	4. Illustrates the text with appropriate maps, other graphics, and/or tables.				
<p>D.2. Student will be able to communicate clearly and effectively in an oral format. <i>Plan I: oral defense; Plan II: oral defense</i></p>	1. Uses appropriate volume, eye contact, pacing, and gestures.				
	2. Illustrates oral presentation with appropriate visual aids.				
	3. Structure is organized in a logical way.				
	4. Adheres to time limits.				

# Appendix E

# Appendix E: Learning Goals and Outcomes, All Programs

## Bachelor of Science Degree Program

### Broad Learning Goals

- A. Students will develop an ability to see meaning in the arrangement of things in space.
- B. Students will become geographical problem-solvers capable of using quantitative and spatial methods of analysis.
- C. Students will be able to employ geospatial technologies in the acquisitions, manipulation, and analysis of digital spatial data.
- D. Students will become clear and effective communicators.

### Student Learning Outcomes

- A1. Students will be able to explain a prominent geographic pattern using core geographic concepts.
- B1. Students will be able to identify the geographic contexts relevant to an inquiry.
- B2. Students will be able to acquire and manipulate data relevant to a geographical inquiry.
- B3. Students will be able to assess the results of a data-driven geographical inquiry.
- C1. Students will be able to identify, collect and process digital spatial data using industry-standard tools.
- C2. Students will be able to employ appropriate geospatial analysis methods and interpret the results.
- D1. Students will be able to communicate clearly and effectively in an oral format.
- D2. Students will be able to communicate clearly and effectively in a written format.
- D3. Students will be able to communicate clearly and effectively in a cartographic format.

## Bachelor of Arts Degree Program

### Broad Learning Goals

- A. Students will develop an ability to see meaning in the arrangement of things in space.
- B. Students will develop an ability to see relationships between people, places, and the environment.
- C. Students will become geographical problem-solvers capable of using qualitative, quantitative and/or spatial methods of analysis.
- D. Students will become clear and effective communicators.

### Student Learning Outcomes

- A1. Students will be able to explain a prominent geographic pattern using core geographic concepts.
- B1. Students will be able to analyze the relationships that influence human-environment interaction in a specific location at a specific time.
- C1. Students will be able to identify the geographic contexts relevant to an inquiry.
- C2. Students will be able to acquire and manipulate data relevant to a geographical inquiry.
- C3. Students will be able to assess the results of a data-driven geographical inquiry.
- D1. Students will be able to communicate clearly and effectively in an oral format.
- D2. Students will be able to communicate clearly and effectively in a written format.

## **Master of Science Degree Program**

### Broad Learning Goals

- A. Students will learn to conduct legitimate and original research on geographical topics.
- B. Students will develop an ability to communicate clearly and effectively.
- C. Students will prepare themselves for professional careers in Geography.

### Student Learning Outcomes

- A1. Students will be able to state an original research question appropriate for geographic analysis.
- A2. Students will be able to state how a research project contributes to an existing body of geographic literature.
- A3. Students will be able to design legitimate geographic methodology.
- A4. Students will be able to implement legitimate geographic methodology.
- B1. Students will be able to communicate clearly and effectively in a written format.
- B2. Students will be able to communicate clearly and effectively in an oral format.
- C1. Students will be able to enter professional positions or Ph.D. programs related to geography or environmental management.

# Appendix F

## Appendix F: APR Criterion 5: Faculty Credentials Template

**Directions:** Please complete the following table by: **1)** listing the full name of each faculty member associated with the designated department/academic program(s); **2)** identifying the contract status of each faculty member (i.e., FTT, FTN, LT, PT or AD); **3)** listing the name of the institution(s) and degree(s) earned by each faculty member; **4)** designating the program level(s) at which each faculty member teaches one or more course (i.e., “X”); and **5)** indicating the credential(s) earned by each faculty member that qualifies him/her to teach courses at one or more program levels (i.e., TDD, TDDR, TBO or Other). Please include this template as an appendix in your self-study report for Criterion 5A.

**Name of Department/Academic Program(s):** Department of Geography & Environmental Studies

**NOTE:** Please add rows to the table as needed.

Full First and Last Name	Contract Status <ul style="list-style-type: none"> <li>• Full-Time Tenure (FTT),</li> <li>• Full-Time Non-Tenure (FTN),</li> <li>• Lecturer (LT),</li> <li>• Part-Time (PT), OR</li> <li>• Adjunct (AD)</li> </ul>	Institution(s) Attended and Degrees Earned (e.g., University of New Mexico—BS in Biology; University of Joe Dane—MS in Anthropology; John Doe University—PhD in Psychology)	Program Level(s) (Please leave blank or provide “N/A” for each level(s) the faculty does not teach one or more courses/)		Faculty Credentials <ul style="list-style-type: none"> <li>• Faculty completed a terminal degree in the discipline/field (TDD);</li> <li>• Faculty completed a terminal degree in the discipline/field and have record of research/scholarship in the discipline/field (TDDR);</li> <li>• Faculty completed a terminal degree outside of the discipline/field but earned 18+ graduate credit hours in the discipline/field (TDO); OR</li> <li>• Other</li> </ul>
			Undergraduate	Graduate	
1. Melinda Benson	FTT	<b>JD</b> , U. Idaho <b>MS Counseling</b> , U. Wyoming <b>BA Political Science</b> , U. Oregon	Undergraduate	X	Other (terminal degree in cognate field and research/scholarship in the discipline)
			Graduate	X	
			Doctoral		
2. Ronda Brulotte	FTT	<b>PhD Anthropology</b> , U. Texas <b>MA Latin American Studies</b> , U. Texas <b>BA Spanish, Latin American Studies</b> , U. Washington	Undergraduate	X	Other (terminal degree in cognate field)
			Graduate	X	
			Doctoral		
3. John Carr	FTT	<b>PhD Geography</b> , U. Washington <b>JD</b> , U. Texas <b>BA</b> , Trinity U.	Undergraduate	X	TDDR
			Graduate	X	
			Doctoral		
4. Christopher Duvall	FTT	<b>PhD Geography</b> , U. Wisconsin <b>MS Environmental Studies</b> , San Jose State U. <b>BA History</b> , U.C. Santa Cruz	Undergraduate	X	TDDR
			Graduate	X	
			Doctoral		
5. Scott Freundsuh	FTT	<b>PhD Geography</b> , SUNY-Buffalo <b>MA Geography</b> , SUNY-Buffalo <b>BS Geology</b> , U. Minnesota	Undergraduate	X	TDDR
			Graduate	X	
			Doctoral		



Full First and Last Name	Contract Status <ul style="list-style-type: none"> <li>• Full-Time Tenure (FTT),</li> <li>• Full-Time Non-Tenure (FTN),</li> <li>• Lecturer (LT),</li> <li>• Part-Time (PT), OR</li> <li>• Adjunct (AD)</li> </ul>	Institution(s) Attended and Degrees Earned  (e.g., University of New Mexico—BS in Biology; University of Joe Dane—MS in Anthropology; John Doe University—PhD in Psychology)	Program Level(s) (Please leave blank or provide “N/A” for each level(s) the faculty does not teach one or more courses/)		Faculty Credentials <ul style="list-style-type: none"> <li>• Faculty completed a terminal degree in the discipline/field (TDD);</li> <li>• Faculty completed a terminal degree in the discipline/field and have record of research/scholarship in the discipline/field (TDDR);</li> <li>• Faculty completed a terminal degree outside of the discipline/field but earned 18+ graduate credit hours in the discipline/field (TDO); OR</li> <li>• Other</li> </ul>
6. Xi Gong	FTN	<b>BA Geography</b> , U. Minnesota <b>PhD Geographic Information Science</b> , Texas State <b>MSc Cartography &amp; GIS</b> , U. Chinese Academy Sciences <b>BEng Spatial Informatics &amp; Digitalized Tech</b> , Wuhan U.	Undergraduate Graduate Doctoral	X X	TDD
7. Constantine Hadjilambrinos	FTT	<b>PhD Urban Affairs and Public Policy</b> , U. Delaware <b>MS Mechanical Engineering</b> , Oregon State <b>BS Mechanical Engineering</b> , Oregon State	Undergraduate Graduate Doctoral	X X	Other (terminal degree in cognate field)
8. K. Maria D. Lane	FTT	<b>PhD Geography</b> , U. Texas <b>MS CRP</b> , U. Texas <b>BA Latin Amer. Studies</b> , U. Virginia	Undergraduate Graduate Doctoral	X X	TDDR
9. Yan Lin	FTN	<b>PhD Geographic Information Science</b> , Texas State <b>MS Cartography and Geographic Information System</b> , Central South University <b>BSc Geographic Information Systems</b> , Hunan Normal University	Undergraduate Graduate Doctoral	X X	TDDR
10. Caitlin L. Lippitt	FTN	<b>PhD Geography</b> , San Diego State U. and U.C. Santa Barbara (joint program) <b>MS Geography</b> , San Diego State U. <b>BA Geography</b> , U.C. Santa Barbara	Undergraduate Graduate Doctoral	X	TDD
11. Christopher D. Lippitt	FTN	<b>PhD Geography</b> , San Diego State U. and U.C. Santa Barbara (joint program) <b>MS Geographic Information Science</b> , Clark University <b>BA Geography</b> , Clark University, 2005	Undergraduate Graduate Doctoral	X X	TDDR
12. Lindsay Smith	FTN	<b>PhD Anthropology</b> , Harvard <b>MA Medical Anthropology</b> , Harvard <b>BA Anthropology</b> , Rice	Undergraduate Graduate Doctoral	X X	Other (terminal degree in cognate field)
13.			Undergraduate Graduate Doctoral		
14.			Undergraduate Graduate Doctoral		
15.			Undergraduate		

Full First and Last Name	Contract Status <ul style="list-style-type: none"> <li>• Full-Time Tenure (FTT),</li> <li>• Full-Time Non-Tenure (FTN),</li> <li>• Lecturer (LT),</li> <li>• Part-Time (PT), OR</li> <li>• Adjunct (AD)</li> </ul>	Institution(s) Attended and Degrees Earned (e.g., University of New Mexico—BS in Biology; University of Joe Dane—MS in Anthropology; John Doe University—PhD in Psychology)	Program Level(s) (Please leave blank or provide “N/A” for each level(s) the faculty does not teach one or more courses/)		Faculty Credentials <ul style="list-style-type: none"> <li>• Faculty completed a terminal degree in the discipline/field (TDD);</li> <li>• Faculty completed a terminal degree in the discipline/field and have record of research/scholarship in the discipline/field (TDDR);</li> <li>• Faculty completed a terminal degree outside of the discipline/field but earned 18+ graduate credit hours in the discipline/field (TDO); OR</li> <li>• Other</li> </ul>
			Graduate		
			Doctoral		
16.			Undergraduate		
			Graduate		
			Doctoral		

# Appendix G

## Appendix G: Abbreviated Vitas for GES Faculty

Melinda Harm Benson  
Department of Geography and Environmental Studies

### *Employment*

*Associate Professor, 2014-present*

*Assistant Professor, 2008-2014*

UNIVERSITY OF NEW MEXICO, GEOGRAPHY AND ENVIRONMENTAL STUDIES DEPARTMENT; affiliated faculty with the College of Law, the Water Resources Program, and Sustainability Studies

*Lecturer and Research Scientist, 2004-08*

UNIVERSITY OF WYOMING, HAUB SCHOOL AND RUCKELSHAUS INSTITUTE OF ENVIRONMENT AND NATURAL RESOURCES

### Books

**Benson M.H.** and R.C. Craig. The End of Sustainability: Resilience, Narrative, and Environmental Governance in the Anthropocene (in review with University Press of Kansas; publication in 2017).

### Editorships

Co-editor with Craig Allen and Ahjond Garmestani of the *Ecology and Society* Special Feature on “Law and Social-Ecological Resilience, Part I” (2013)

<http://www.ecologyandsociety.org/issues/view.php/feature/78>.

### Articles in Refereed Journals and Law Reviews

Lance Gunderson, Barbara A. Cosens, Brian C. Chaffin, Craig Anthony Arnold, Alexander K. Fremier, Ahjond S. Garmestani, Robin Kundis Craig, Hannah Gosnell, Hannah E. Birge, Craig R. Allen, **Melinda H. Benson**, Ryan Morrison, Mark C. Stone, Joseph A. Hamm, Kristine Nemecek, Edella Schlager and Dagmar Lewellyn, Title: Regime Shifts and Panarchies in Regional Scale Social Ecological Water Systems (in press), ES-2016-8879.

Barbara A. Cosens, Robin K. Craig, D.G. Angeler Craig Anthony (Tony) Arnold, **Melinda H. Benson**, Daniel A. DeCaro, Ahjond S. Garmestani, Hannah Gosnell, J.B. Ruhl and Edella Schlager (in press), The Role of Law in Adaptive Governance, *Ecology and Society*, ES-2016-8731.

Chaffin, B.C., A.S. Garmestani, L.H. Gunderson, **M.H. Benson**, D.G. Angeler, C.A. Arnold, B. Cosens, R.K. Craig, J.B. Ruhl, and C.R. Allen. (2016) Transformative Environmental Governance. *Annual Review of Environment and Resources* 41:  
1<http://www.annualreviews.org/doi/abs/10.1146/annurev-environ-110615-085817>.

**Benson, M.H.** (2016). Shifting Public Land Management Paradigms: Lessons from the Valles Caldera National Preserve. *Virginia Environmental Law Journal*, 34 (1), 1-51.

**Benson, M.H.**, C. Lippitt, R. Morrison, B. Cosens, J. Boll, B.C. Chaffin, R. Heinse, D. Kauneckis, T. E. Link, C. Scruggs, M. Stone, V. Valentin. (2015). Five Ways Institutions Can Support Interdisciplinary Work *Before Tenure*, *Journal of Environmental Studies and Sciences*, 6(2), 260-267.

**Benson, M.H.** (2015). Reconceptualizing social-ecological relations – is resilience the new narrative? *Journal of Environmental and Sustainability Law* 99-127.

**Benson, M.H.**, D. Llewellyn, R. Morrison and M. Stone (2014). Water Governance Challenges in New Mexico's Rio Grande Valley: a Resilience Assessment, *Idaho Law Review* 51:195-228.

**Benson, M.H.** and R.K. Craig (2014). "The End of Sustainability," *Society & Natural Resources: An International Journal*; Vol. 27(7) 777-782; <http://dx.doi.org/10.1080/08941920.2014.901467>

Cosens, B.; Gunderson, L.; Allen, C.; **Benson, M.H.** (2014). "Identifying Legal, Ecological and Governance Obstacles, and Opportunities for Adapting to Climate Change." *Sustainability* 6: 2338-2356.

**Benson, M.H.** (2014) "Enforcing Traditional Cultural Property Protections" *Human Geography* 7(2) 60-72.

Craig, R.K. and **M.H. Benson** (2013). "Replacing Sustainability." *Akron Law Review* 46: 841-880.

**Benson, M.H.** and A. B. Stone (2013). "Practitioner Perceptions of Adaptive Management Implementation in the United States." *Ecology and Society* 18 (3): 32.[online] URL: <http://www.ecologyandsociety.org/vol18/iss3/art32/>.

**Benson, M.H.**, R. R. Morrison and M. C. Stone (2013). "A Classification Framework for Running Adaptive Management Rapids." *Ecology and Society* 18 (3):30. [online] URL: <http://www.ecologyandsociety.org/vol18/iss3/art30/>.

### **Selected Service in Department College, University Committees**

Member, College of Arts and Sciences Sabbatical Selection Committee, 2016-present

Associate Chair, University of New Mexico, Department of Geography and Environmental Studies, 2015-present

Chair, Search Committee, Assistant Professor in GIScience, University of New Mexico, Department of Geography and Environmental Studies, October 2015-present

Director, Undergraduate Studies, University of New Mexico, Department of Geography and Environmental Studies, 2012-2014

**John Newman Carr**  
**Department of Geography and Environmental Studies**  
**University of New Mexico**

**Associate Professor**

Department of Geography and Environmental Studies  
*University of New Mexico*

**Education**

**Ph.D., University of Washington**, Seattle, Washington  
Geography

Dissertation: The Political Grind – The Role of Youthful Identities in the Politics of Public Space

**J.D. 1993, University of Texas School of Law**, Austin, Texas

**Professional Recognition, Honors, etc.**

2016 University of Tasmania Visiting Scholar, Hobart Australia. Research fellowship. 2016

2016 Visiting Erskine Fellowship, University of Canterbury, Christchurch New Zealand. Visiting teaching and scholar position. 2016.

2013 Teacher of the Year, University of New Mexico OSET, one of two University-wide teaching awards for pre-tenure Faculty

**Grants and Funding**

“Geospatial Privacy: Legal, Social and Ethical Implications for Users of Geocoded Data.” PI: John Carr, co-PI’s Paul Zandbergen, Shannon Vallor, William Gannon  
1 year, \$30,000, NSF Ethics Education in Science and Engineering (EASE) competition. September 1, 2012 - June 31, 2014.

**Publications**

**Carr, J.**, Dickinson, E. A., McKinnon, S., & Chávez, K. (2016). Kiva’s Flat, Flat World: The Placelessness of Microcredit in Cyberspace . *Globalizations* 13(2), 143-157.

**Carr, J.**, Vallor S., Freundsuh S., Gannon, W., Zandbergen, P. (2014), Hitting the moving target: the challenges of creating a dynamic curriculum addressing the ethical dimensions of geospatial data, *Journal of Geography in Higher Education*. 38(4), 444-454.

**Carr, J.** (2014) Invited Chapter: “Making Urban Politics Go Away: The role of legally mandated planning processes in occluding city-level power.” In M. Davidson and D. Martin (Eds.) *Urban Politics: Critical Approaches*. Sage (London)[Article].

**Carr, J.** (2012). Public Input/Elite Privilege: The use of participatory planning to reinforce urban geographies of power in Seattle. *Urban Geography*, 33(3). 420-441.

**Carr, J.** (2012). Activist Research and City Politics: Ethical lessons from youth-based public scholarship. *Action Research Journal*. 10(1), 61-78.

**Carr, J.** (2010). Skating Around The Edges Of The Law: Urban Skateboarding And The Role Of Law In Determining Young Peoples' Place In The City. *Urban Geography*. 31 (7), 988-1003 (Legal Geographies series).

**Carr, J.,** Herbert, S.K., & Brown, E. (2009). Inclusion under the law, exclusion from the city: The regulation of bodies and places in Seattle. *Environment & Planning: A*. 41(8), 1962 -1978.

**Teaching: UNIVERSITY OF NEW MEXICO**

Associate Professor, 2015-present; Assistant Professor 2009-2015; Visiting Professor 2008-2009

**The City (Geography 566/466)**

Combined undergraduate and graduate course exploring the ways historical and spatial vectors of difference animate urban planning, form, and placemaking

Fall 2016, Spring 2015, Spring 2014, Spring 2013, Spring 2011, Spring 2010, Spring 2008

**Introduction to Human Geography: Globalization (Geography 102)**

Large, lecture style undergraduate course providing an overview of essential human geography concepts through the lens of globalization theory and research

Fall 2015, Fall 2013, Fall 2012, Fall 2014, Summer 2012, Fall 2011, Summer 2011, Fall 2010, Fall 2009

**Legal Geography (Geography 364)**

Undergraduate course outlining the mutually constitutive relationship between the legal system and human geographies, with a particular focus on exploring the role of law in informing urban space and regulation

Spring 2015, Spring 2014, Spring 2013, Spring 2011, Spring 2010

**Legal Geography (Geography 517)**

Graduate seminar exploring advanced geographic theory outlining the mutually constitutive relationship between the legal system and human geographies, with a particular focus on exploring the role of law in informing urban space and regulation

Fall 2014

**Geographic History and Method (Geography 501)**

Graduate seminar providing an overview of geographic history and contemporary debates and developments across the discipline.

Fall 2016, Fall 2015, Fall 2014, Fall 2013

## Chris S. Duvall

### Professional preparation

Doctor of Philosophy, Geography, 2006; University of Wisconsin, Madison, WI  
Master of Science, Environmental Studies, 2000; San José State University, San José, CA  
Bachelor of Arts, History, 1994; University of California, Santa Cruz, CA

### Appointments

8/2013-present Department of Geography, University of New Mexico, Albuquerque, NM  
Associate Professor  
8/2008-8/2013 Department of Geography, University of New Mexico, Albuquerque, NM  
Assistant Professor  
1/2007-8/2008 Department of Geography, Michigan State University, East Lansing, MI  
Assistant Professor

### Publications (selected, last 10 years)

- Duvall, C.S. 2017. Science, society, and knowledge of the Columbian Exchange: The case of *Cannabis*. In *Environmental History in the Making. Volume I: Explaining* (E. Vaz, C. Joanez de Melo, & L.M. Costa Pinto, eds.): 225-241. Springer Publishing: New York.
- Sluyter, A. and C.S. Duvall. 2016. African rangeland burning and colonial ranching landscapes in the neo-tropics. *The Geographical Review* 106(2): 294-311.
- Duvall, C.S. 2016. Drug laws, bioprospecting, and the agricultural heritage of *Cannabis* in Africa. *Space and Polity* 20(1): 10-25.
- Duvall, C.S. 2015. *Cannabis*. London: Reaktion Books.
- Duvall, C.S. 2015. Geography. In *The Princeton Companion to Atlantic History* (J.C. Miller, ed.). MTM Press: New York.
- Lave, R., M. Wilson, E. Barron, C. Biermann, M. Carey, C.S. Duvall, L. Johnson, K. Lane, N. McClintock, D. Munroe, R. Pain, J. Proctor, B. Rhoads, M. Robertson, J. Rossi, N. Sayre, G. Simon, M. Tadaki, C. Van Dyke. 2014. Intervention: critical physical geography. *Canadian Geographer* 58(1): 1-10.
- Junker, J., R. Bergl, S. Blake, C. Boesch, G. Campbell, A. Dunn, L. du Toit, C.S. Duvall, A. Ekobo, G. Etoga, A. Galat-Luong, J. Gamys, J. Ganas-Swaray, S. Gatti, A. Ghiurghi, N. Granier, E. Greengrass, J. Hart, J. Head, I. Herbinger, T.C. Hicks, B. Huijbregts, I.S. Imong, N. Kuempel, S. Lahm, J. Lindsell, F. Maisels, M. McLennan, L. Martinez, B. Morgan, D. Morgan, F. Mulindahabi, R. Mundry, K.P. N'Goran, E. Normand, A. Ntongho, D.T. Okon, C.-A. Petre, A. Plumptre, H. Rainey, S. Regnaut, C. Sanz, E. Stokes, A. Tondossama, S. Tranquilli, J. Sunderland-Groves, P. Walsh, Y. Warren, E.A. Williamson, H.S. Kuehl. 2013. Recent decline in suitable environmental conditions for African great apes. *Diversity and Distributions* 18(11): 1077-1091.
- Gruley, J. and C.S. Duvall. 2012. The evolving narrative of the Darfur conflict as represented in *The New York Times* and *The Washington Post*, 2003-2009. *GeoJournal* 77(1): 29-46.
- Duvall, C.S. 2012. *Ceiba pentandra* (L.) Gaertn. In *Plant Resources of Tropical Africa, Vol. 16: Fibers* (M. Brink & E.G. Achigan-Dako, eds.): 75-82. PROTA Foundation: Wageningen, The Netherlands.
- Duvall, C.S. 2011a. Biocomplexity from the ground up: Vegetation patterns in a West African savanna landscape. *Annals of the Association of American Geographers* 101(3): 497-522.
- Duvall, C.S. 2011b. Ferricrete, forests, and temporal scale in the production of colonial science in Africa. In *Knowing Nature: Conversations at the Interface of Political Ecology and Science Studies* (M.J. Goldman, P. Nadasdy, & M.D. Turner, eds.): 113-127. University of Chicago Press: Chicago.
- Duvall, C.S. 2010. Agroforestry. In *The Encyclopedia of Geography* (B. Warf, ed.): 60-62. Sage Publications: London.



- Duvall, C.S, P. Howard, and K. Goldsberry. 2010. Apples and oranges? Classifying food retailers based on fresh produce availability in a Midwestern U.S. city. *Journal of Hunger and Environmental Nutrition* 5(4): 526-541.
- Duvall, C.S. 2009. A Maroon legacy? Sketching African contributions to live fencing practices in early Spanish America. *Singapore Journal of Tropical Geography* 30(2): 232-247.
- Duvall, C.S. 2008a. Classifying physical geographic features: The case of Maninka farmers in southwestern Mali. *Geografiska Annaler B (Human Geography)* 90(4): 327-348.
- Duvall, C.S. 2008b. Human settlement ecology and chimpanzee habitat selection in Mali. *Landscape Ecology* 23(6): 699-716.
- Duvall, C.S. 2008c. *Pterocarpus erinaceus* Poir. In *Plant Resources of Tropical Africa, Vol. 7: Timbers* (D. Louppe, A. Oteng-Amoako, & M. Brink, eds.): 478-482. Backhuys Publishers: Leiden, The Netherlands.
- Duvall, C.S. 2008d. Human settlement ecology and chimpanzee habitat selection in Mali. *Landscape Ecology* 23(6): 699-716.
- Duvall, C.S. 2007. Human settlement and baobab distribution in southwestern Mali. *Journal of Biogeography* 34(11): 1947-1961.
- Duvall, C.S. 2006. On the origin of the tree *Spondias mombin* in Africa. *Journal of Historical Geography* 32(2): 249-266.

#### Teaching Experience (at University of New Mexico)

Course [course level]	No. of Semesters	No. of Students	Total Credit Hours
Geog. 101: Introduction to Physical Geography [undergrad.]	8	1,245	3,734
Geog. 281L: Survey of Geographic Information Science [undergrad.]	3	47	188
Geog 350: Physical Landscapes [undergrad.]	1	19	57
Geog 464/564: Food and Natural Resources [undergrad. and grad.]	8	262	786
Geog 471: Applied Geography Seminar [undergrad.]	3	58	174
Geog 515: Cultural and Political Ecology [grad.]	5	59	177

#### Graduate Student Mentorship (last 5 years)

- Current advisees (UNM Department of Geography): Hayley Hajic, Anjanette Hawk, Aaron Russell, Sagert Sheets
- Completed (UNM Department of Geography unless otherwise noted): Autumn Carr, Stephen Griego, Bryan Kinworthy, Joseph Leestma (UNM Latin American Studies), Katherine Lenzer, Kris Lindgren, William Maxwell, Maureen Meyer, Roberto Valdez

#### Current Campus-Level Service Responsibilities (selected)

- 10/2016-present International Studies Institute, University of New Mexico  
Member, Faculty Advisory Board
- 10/2016-present College of Arts and Sciences, University of New Mexico  
Member, Promotion and Tenure Review Committee
- 8/2016-present Latin American and Iberian Studies Institute, University of New Mexico  
Member, Grants and Awards Committee
- 8/2015-present Latin American and Iberian Studies Institute, University of New Mexico  
Member, Executive Committee [peer-elected position]
- 8/2013-present College of Arts and Sciences, University of New Mexico  
Member, Interdisciplinary Committee on Latin American Studies (ICLAS)

## **Scott M. Freundschuh**

### ***Professional Preparation***

University of Minnesota Geography BA, 1985

University of Minnesota Geology BS, 1985

State University of New York Buffalo Geography MA, 1985

State University of New York Buffalo Geography PhD, 1992

University of Maine

National Center for Geographic Information and Analysis Postdoc, 1993-1994

### **Appointments**

8/2010 to present Professor, University of New Mexico Albuquerque, Department of Geography

5/2010 – 8/2010 Professor, University of Minnesota Duluth, Department of Geography (Promotion to full professor approved by the Board of Regents May 13, 2010)

8/2008 – 8/2010 Program Officer - Geography and Spatial Sciences Program, Technical Coordinator – Spatial Intelligence & Learning Center; Division of Social, Behavioral and Economic Sciences/Behavioral and Cognitive Sciences, National Science Foundation (on leave from the University of Minnesota)

9/1997 – 5/2010 Associate Professor, University of Minnesota Duluth, Department of Geography; Cartography, Geographic Information Science, Spatial Cognition

9/1994 – 8/1997 Assistant Professor, University of Minnesota Duluth, Department of Geography Cartography, Geographic Information Science, Spatial Cognition

9/1990 – 8/1994 Assistant Professor, Memorial University of Newfoundland, Department of Geography; Cartography, Geographical Information and Analysis Systems, Spatial Cognition (on leave from 8/1/93 to 9/1/94)

5/1989 – 9/1990 Research Assistant, National Center for Geographic Information and Analysis (NCGIA), State University of New York at Buffalo

7/1987 – 8/1989 Lecturer, State University of New York at Buffalo, Department of Geography; Introduction to Maps and Airphotos

### **Publications**

#### **(i) 5 publications most closely related to the proposed project:**

2015 Fabrikant, S.I., M. Raubal, M. Bertolotto, C. Davies, **S. Freundschuh**, and S. Bell (Eds.). Proceedings, Conference on Spatial Information Theory (COSIT 2015), Santa Fe, NM, USA, Oct. 12-16, 2015. Lecture Notes in Computer Science (LNCS) 9368, Springer, Berlin, Germany.

2015 Kitchin, R. and **S.M. Freundschuh**, (Eds.) *Cognitive Mapping: Past, Present and Future*, Taylor and Francis, 280 pp. ISBN 0415757800

2014 Carr, J., S. Vallor, **S. Freundschuh**, W. Gannon and P. Zandbergen. Hitting the moving target: the challenges of creating a dynamic curriculum addressing the ethical dimensions of geospatial data. *Journal of Geography in Higher Education*, 38(4): 444-454.

<http://dx.doi.org/10.1080/03098265.2014.936313>

2012 **Freundschuh, S.M.** and M. Blades, The Cognitive Development of the Spatial Concepts NEXT, NEAR, AWAY and FAR, In M. Raubal, A. Frank and D. Mark (Eds.) *Cognitive and Linguistic Aspects of Geographic Space – New Perspectives on Geographic Information Research*, Springer, pp. 43-62.

2005 Montello, D.R. and **S.M. Freundschuh**, Cognition of geographic information. In McMaster, R. B

and Usery, E. L. (Eds), *A research agenda for geographic information science*. Boca Raton, FL: CRC Press, 61-91.

**(ii) up to 5 other significant publications:**

2012 Institutional Review for Research in the Social Sciences from the Federal Perspective, *Professional Geographer*, Focus Section titled *Protecting Human Subjects Across the Geographic Research Process*, 64(1): 43-48. <http://dx.doi.org/10.1080/00330124.2011.596791>  
2009 Map Perception and Cognition. In Kitchin, R. and Thrift, N. (Eds.) *International Encyclopedia of Human Geography*, Oxford: Elsevier, 1:334-338.

## **Xi Gong, PhD**

Department of Geography and Environmental Studies, University of New Mexico

Email: xigong@unm.edu Phone: (505)277-5041

### **A. PROFESSIONAL PREPARATION**

Ph.D. in Geographic Information Science, Texas State University, San Marcos, TX	2016
M.Sc. in Cartography & Geographic Information System, University of Chinese Academy of Sciences, Beijing, China	2011
B.Eng. in Spatial Informatics and Digitalized Technology (GIS & Software Engineering), Wuhan University, Wuhan, China	2008

### **B. APPOINTMENTS**

Visiting Assistant Professor Department of Geography & Environmental Studies, University of New Mexico	2016-Present
Prospect Research Analyst South Dakota State University Foundation	2016
Research Assistant Department of Geography, Texas State University	2011-2015
Teaching Assistant Department of Geography, Texas State University	2011-2015
Research Assistant University of Chinese Academy of Sciences	2008-2011
Teaching Assistant Wuhan University	2006-2007

### **C. RESEARCH EXPERIENCE**

Principle Investigator (PI), “Maternal Exposure to Hazardous Air Pollutants and Malformation in Offspring”, Doctoral Research Stipend Award, Texas State University, \$2,850, 01/2014-12/2014.

Doctoral student Personnel, “Air Pollution-Exposure-Health Effect Indicators: Mining Massive Geographically-Referenced Environmental Health Data to Identify Risk Factors for Birth Defects”, USEPA Science to Achieve Results (STAR) Program, with PI: F. Benjamin Zhan and Co-PIs: Jean D. Brender, Jing Yang, and Peter H. Langlois, \$499,987, 08/2011-05/2014.

Research Assistant, “Knowledge Discovery on Spatio-temporal Data”, Knowledge Innovation Program of the Chinese Academy of Sciences, with PI: Tao Pei, 09/2009-06/2011.

Research Assistant, “Spatial Data Cognitive Pattern & Massive Spatial Data Knowledge Discovery”, National Basic Research Program of China (973 Program), 09/2009-06/2011.

Research Assistant, “Spatio-temporal Data Mining and Typical Land Surface Parameters”, Independent Innovation Project of IGSNRR, Chinese Academy of Sciences, 07/2009-06/2011.

Research Assistant, “Soft Spatial Data Co-Statistics Methods Research”, the National Natural Science Foundation of China (NSFC), 02/2008-06/2008.

Principle Investigator (PI), “Online Real Estate Sales Information System based on WebGIS”, Student scientific research project of Wuhan University, 04/2007-02/2008.

Principle Investigator (PI), “Water Pollution Information System of East Lake, Wuhan”, The 2nd Prize in ESRI GIS Development Contest, China (Top 2-4 of 100 groups), 06/2006-08/2006.

#### **D. RELEVANT PEER REVIEWED PUBLICATIONS**

- Gong, X.**, Brender, J.D., Langlois, P.H., Lin, Y., Zhan, F.B. 2016. Validity of the Emission Weighted Proximity Model in estimating air pollution exposure intensities in large geographic areas. *Science of the Total Environment*. 563–564: 478–485.
- Lin, Y., **Gong, X.**, Mousseau, R. 2016. Barriers of Female Breast, Colorectal, and Cervical Cancer Screening Among American Indians—Where to Intervene? *AIMS Public Health*, 3 (4): 891-906.
- Lin, Y., **Gong, X.** 2015. Risk Assessment of Water Pollution Exposure to Hazardous Waste Sites: A case study in Bexar County, Texas. *Papers in Applied Geography*. DOI: 10.1080/23754931.2015.1116105
- Zhang, C., Yang, J., Zhan, F.B., **Gong, X.**, Brender, J.D., Langlois, P.H., Barlowe, S., Zhao, Y. 2015. A Visual Analytics Approach to High-Dimensional Logistic Regression Modeling and its Application to an Environmental Health Study. *IEEE PacificVis 2016*.
- Brender, J.D., Shinde, M.U., Zhan, F.B., **Gong, X.**, Langlois, P.H. 2014. Maternal Residential Proximity to Chlorinated Solvent Emissions and Birth Defects in Offspring: A Case-Control Study. *Environmental Health*, 13(96): 1-16.
- Zhan, F.B., **Gong, X.**, Liu, X. 2013. Mark on the Globe: A Quest for Scientific Bases of Geographic Information and its International Influence. *International Journal of Geographic Information Science*. 28(6): 1233-1245.
- Pei, T., **Gong, X.**, Shaw, S., Ma, T., Zhou, C. 2012. Clustering of Temporal Event Processes, *International Journal of Geographical Information Science*. 27(3): 484-510.
- Gong, X.**, Pei, T., Sun, J., Luo, M. 2011. Review on Research Progress in Trajectory Clustering Methods. *Progress in Geography*. 30(5): 522-534.
- Sun, J., Pei, T., **Gong, X.**, Zhou, C. 2011. Review on Research Progress in Web Spatio-temporal Data Mining. *Advances in Earth Science*. 26(4): 449-459.
- Zhang, C., Yang, J., Zhan, F.B., **Gong, X.**, Brender, J.D., Langlois, P.H., Barlowe, S. 2013. Identifying Risk Factors for Birth Defects in High Dimensional Environmental Health Data. *IEEE VIS 2013*. (VIS Poster (2-page abstract)).

## Constantine Hadjilambrinos

### Education:

Ph.D. May 1993, Urban Affairs and Public Policy, University of Delaware.

M.S. June 1987, Mechanical Engineering, Oregon State University.

B.S. with High Honors and in the Honors Program, June 1984, Mechanical Engineering, Oregon State University.

### Employment:

- 2011-Present Associate Professor, Geography and Environmental Studies, The University of New Mexico.
- 2009-2011 Director, Environmental Studies Program, Sewanee: The University of the South.
- 2004-2009 Associate Professor, School of Public Administration and Department of Political Science, The University of New Mexico.
- 2002-2004 Economist, Utilities Division and Head, Renewable Energy Group, New Mexico Public Regulation Commission.
- 2000-2002 Associate Professor, Department of Environmental Studies, Florida International University. 2001-2002, Sabbatical in Odessa, Ukraine. Affiliation, International Relations Program, Odessa National University.
- 1994-2000 Assistant Professor, Department of Environmental Studies, Florida International University.
- 1993-1994 Post-doctoral Research Fellow, joint appointment: Center for Energy and Environmental Policy and Center for the Study of Marine Policy, University of Delaware.
- 1992-1993 Adjunct Lecturer, Social Sciences Department, Delaware Technical and Community College.
- 1991 Intern, Directorate-General XVII–Energy, Commission of the European Community, Brussels, Belgium.

### Courses taught (selected):

Energy Resources	Energy Policy
Governing the Global Environment	Environmental Management
Natural Resource Policy and Management	Comparative Energy Policy
Energy, Environment and Society	Environmental Politics
Introduction to Environmental Studies	Global Environment and Society

### Selected Service Activities:

#### **Professional**

Board Member, Association for Environmental Studies and Sciences, 2010-2012.

Member, Council of Environmental Deans and Directors, 2009-2011.

Editor, *STS Today*, 2004-2006.

Member of the Executive Board, International Association for Science, Technology and Society, 2004-2006.

Selection Committee, Senior Scholar Competition, Fulbright Program, Kiev, Ukraine. December 2001.

#### **Community**

Governor's Task Force on Distributed Solar Power, New Mexico, 2004-2006.

Governor's Task Force on Concentrated Solar Power, New Mexico, 2004-2006.

### **University**

Grants and Awards Committee, Latin American and Iberian Institute, University of New Mexico, 2014-present

Faculty Senate, University of New Mexico, 2012-present.

Mid-probationary Review Subcommittee, Tenure and Promotion Committee, College of Arts and Sciences, University of New Mexico, 2014-2015.

University Sustainability Council, Sewanee: The University of the South, 2009-2011.

Faculty Senate Budget Committee, University of New Mexico, 2007-2009.

Faculty Senate Operations Committee, University of New Mexico, 2005-2006.

Faculty Senate, University of New Mexico, 2004-2007.

Member of Steering Committee, European Studies Certificate, FIU. 1997-1999. **Selected**

### **Publications**

#### **Books**

Thiel, D. and Hadjilambrinos, C. (Translators) Alexis Stamatis, *American Fugue*, Wilkes Barre, PA: Etruscan Press, 2008.

#### **Edited Journal Issues**

Guest editor, Special Theme Issue on Global Climate Change, *Bulletin of Science, Technology and Society*, Vol. 19, No. 6, 1999.

#### **Journal Articles**

Hadjilambrinos, C. and Thiel, D. (2016) "Engaging the World: Literature, Science, and the Call to Action on Global Warming" *International Journal of Management and Applied Science*, Vol. 2, No. 5, pp. 13-18.

Hadjilambrinos, C. (2006) "The High-Level Radioactive Waste Policy Dilemma: Prospects for a Realistic Management Policy" *Journal of Technology Studies*, Vol. 32, No. 2, pp. 95-103.

Hadjilambrinos, C. (2005) "Electricity Industry Restructuring: Lessons from the British and Norwegian Experience." *IEEE Technology and Society Magazine*, Vol. 24, No. 4, pp. 27-35.

Hadjilambrinos, C. (2000) "Understanding Technology Choice in Electricity Industries: A Comparative Study of France and Denmark." *Energy Policy*, Vol. 28, No. 15, pp. 1111-1126.

Hadjilambrinos, C. (2000) "An Egalitarian Response to Utilitarian Analysis of Long-Lived Pollution: The Case of High-Level Radioactive Waste." *Environmental Ethics*, Vol. 22, No. 2, pp. 43-62.

**Department of Geography and Environmental Studies**

University of New Mexico, mdlane@unm.edu

**Educational History**

Ph.D. Geography, 2006, University of Texas at Austin

M.S. Community and Regional Planning, 2000, University of Texas at Austin

B.A. Latin-American Studies (with Highest Distinction), 1995, University of Virginia

**Positions Held at University of New Mexico**

2014-present, Chair, Department of Geography & Environmental Studies

2013-present, Associate Professor, Department of Geography & Environmental Studies

2007-2013, Assistant Professor, Department of Geography & Environmental Studies

2006-2007, Adjunct Assistant Professor, Department of Geography

**Selected Professional Recognitions and Honors**

2016, Distinguished Visiting Scholar, Queen's University, Belfast

2016-present, Member, J.B. Jackson Prize Award Committee, AAG

2015-2016, Chair, Nominating Committee (elected), AAG

2010, Outstanding New Teacher of the Year Award, University of New Mexico

2006, Price/Webster Prize, for best *Isis* article, History of Science Society

**Authored Books**

Lane, K. Maria D. (2011) *Geographies of Mars: Seeing and Knowing the Red Planet* (Chicago: University of Chicago Press) ISBN: 9780226470788.

**Selected Refereed Articles and Chapters**

Lane, K. Maria D. (in press) "Bridging the Florida Keys: engineering an environmental transformation, 1904-1912." In *American Environment Revisited*, eds. Geoff Buckley and Yolanda Youngs (Rowman & Littlefield).

Lane, K. Maria D. (2016) "Pros and cons of a cosmopolitan classroom," in *Going Inward: the Role of Cultural Introspection in College Teaching*, eds. S. D. Longerbeam and A. F. Chávez (New York: Peter Lang Publishing), pp. 181-190.

Rebecca Lave, Matthew W. Wilson, Elizabeth S. Barron, Christine Biermann, Mark A. Carey, Chris S. Duvall, Leigh Johnson, **K. Maria Lane**, Nathan McClintock, Darla Munroe, Rachel Pain, James Proctor, Bruce L. Rhoads, Morgan M. Robertson, Jairus Rossi, Nathan F. Sayre, Gregory Simon, Marc Tadaki and Christopher Van Dyke (2014) "Intervention: Critical physical geography." *Canadian Geographer* 58(1): 1-10.



- Perramond, Eric P. and K. Maria D. Lane (2014) "Territory to state: law, power, and water in New Mexico," in *Negotiating Territoriality: Spatial Dialogues between State and Tradition*, eds. Allan Charles Dawson, Laura Zanotti, and Ismael Vaccaro (New York: Routledge), 142-162.
- Lane, K. Maria D. (2013) "Reading Boulder Dam: landscape alteration as national transformation in 1930s America." *Aether: The Journal of Media Geography*, 11: 102-126. (Special issue on "Landscape, history, and media," eds. Christina Dando and Eric Olmansen.)
- Lane, K. Maria D. (2011) "Water, technology, and the courtroom: Negotiating reclamation policy in territorial New Mexico." *Journal of Historical Geography*, 37: 300-311.

### **Selected Invited Lectures**

- 2016, "Colonial Geographies of Mars: Past, Present and Future." SSC School Seminar, Queen's University, Belfast UK, October 27.
- 2016, "The Geographies of Mars." Humanities Center at DePaul University, Chicago, IL, October 17.
- 2015, "Geographies of science." *Academic and Student Affairs Committee, Board of Regents, University of New Mexico: September 3.*

### **Selected Professional Service**

- 2011-2017, Co-Editor, *Historical Geography*
- 2014, Co-organizer, joint meeting of the Southwest and Great Plains / Rocky Mountains Divisions of the AAG, Albuquerque, NM: October 23-25.
- 2014-present, Editorial Board, *Southwestern Geographer*

### **Selected Research Funding Awards as PI**

- Student Experience in National Trails GIS Development Activities (\$25,383), U.S. Department of Interior, National Park Service, CP-CESU, 2016-2017
- Re-Imagining the Islands: Environmental Change in the Florida Keys (\$8,382), UNM Research Allocation Committee, 2015-2017
- Student Experience in National Trails GIS Development Activities (\$25,098), U.S. Department of Interior, National Park Service, 2015-2016
- Intersections of Authority: Science, Law and the Management of Water Resources in New Mexico's Rio Grande Valley (\$132,412), National Science Foundation, 2008-2011

### **Recent Peer Reviewing for Journals, Academic Presses, and Funding Agencies**

- 2016 *Journal of Historical Geography, Isis*
- 2015 University of Chicago Press, *Geographical Research, Journal of Historical Geography*, National Endowment for the Humanities
- 2014 *Environmental History, Journal of Historical Geography*, University of Chicago Press

Caitlin L. Lippitt  
Department of Geography & Environmental Studies, University of New Mexico  
Albuquerque, NM 87031-1091  
Phone +1 (508) 317-7773 E-mail caitlippitt@unm.edu

### **Professional Preparation**

University of California, Santa Barbara Geography B.A. 2002

San Diego State University Geography M.S. 2007

San Diego State University & University of California, Santa Barbara Geography Ph.D. 2013

### **Appointments**

2013-present Assistant Professor, Department of Geography & Environmental Studies, University of New Mexico

2013 Adjunct Professor, Department of Geography, San Diego Mesa College

2010-2013 Research Assistant, Department of Geography, San Diego State University

2006-2010 Teaching Assistant, Department of Geography, San Diego State University

2005-2006 Research Assistant, Department of Geography, San Diego State University

### **Publications**

Lippitt, C.L., Stow, D., O'Leary, J.O., Franklin, J. 2013. The influence of short-interval fire occurrence on post-fire recovery of fire-prone shrublands in California, USA. *International Journal of Wildland Fire* 22, 184-193.

Deutschman, D., Strahm, S., Stow, D.A., Lippitt, C.L., and Coulter, L.L. 2013. Vegetation Monitoring for the San Diego Multiple Species Conservation Program: Comparison of Vegetation Community Mapping, Remote Sensing using MESMA, and Field Data. *SANDAG Final Report 2013*.

Stow, D., Toure, S. Lippitt, C.L., Lippitt, C.D., Lee, C. 2012. Frequency distribution signatures and classification of within-object pixels, *International Journal of Applied Earth Observation and Geoinformation* 15, 49-56.

### **Publications in Preparation**

Lippitt, C.L., Stow, D.S., Roberts, D.A., O'Leary, J.O., Still, C., Fraley, G. In preparation. Signature variability of native and nonnative herbaceous vegetation in California sage scrub based on spectral reflectance time series. Target: *Photogrammetric Engineering and Remote Sensing*.

Lippitt, C.L., Stow, D.S., Roberts, D.A. In preparation. Spectral-temporal mixture analysis of moderate resolution imagery for herbaceous cover mapping in shrubland habitats. Target: *International Journal of Remote Sensing*.

Lippitt, C.L., Stow, D.S., Roberts, D.A, Coulter, L.L. In preparation. Multitemporal MESMA for Monitoring Herbaceous and Other Vegetation Growth Forms in Southern California Shrublands. UNM Geography & Environmental Studies, Self-Study 2017

Target: *Journal of Environmental Management*.

Lippitt, C.L. In preparation. Object-based Image Analysis of Piñon Pine Mortality in Central New Mexico. Target: *Forests*. Special Issue "Remote Sensing of Forest Disturbance." Synergistic Activities

### **Graduate Advisors**

Dr. Douglas Stow (San Diego State University, PhD Chair, MS Chair), Dr. Dar Roberts (University of California Santa Barbara, PhD committee), Christopher Still (Oregon State University, PhD committee), John O'Leary (San Diego State University, PhD committee, MS Committee), Janet Franklin

Thesis Advisor

Current (3) Allen, Akashia, M.S., University of New Mexico, Zachary Taraschi, M.S., University of New Mexico, Gladys Valentin, M.S., University of New Mexico

Complete (1) Brewer, William, M.S., University of New Mexico (2016)

**Collaborators & Other Affiliations** Craig Allen (United States Geological Survey), William Brewer (San Diego State University), Douglas Deutchmann (San Diego State University), K. Maria Lane (University of New Mexico), Chung-ruí Lee (San Diego State University), Marcy Litvak (University of New Mexico), Andrew Loerch (San Diego State University), Will Pockman (University of New Mexico), Jenn Rutgers (University of New Mexico), Mark Stone (University of New Mexico), Douglas Stow (San Diego State University), Spring Straham (San Diego State University), Sory Toure (San Diego State University)

### **Synergistic Activities**

Faculty Advisor, American Society of Photogrammetry and Remote Sensing (ASPRS) UNM Student Chapter, 2015-present

Treasurer, ASPRS Rio Grande Chapter, 2015-present

Chapter Director, Association of American Geographers Remote Sensing Specialty Group, 2015-present

## Yan Lin, PhD

Department of Geography and Environmental Studies, University of New Mexico  
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### A. Professional preparation

Texas State University	Geographic Information Science	PhD, 2014
Central South University	Cartography and Geographic Information System	MS, 2009
Hunan Normal University	Geography Information Systems	BSc, 2006

### B. Appointments

Assistant Professor of GIScience Department of Geography and Environmental Studies, University of New Mexico	2016-Present
Assistant Professor of GIScience Department of Geography, South Dakota State University	2014-2016
Research Associate at Texas Center for Geographic Information Science Department of Geography, Texas State University	2013-2014
Instructor (Teacher of Record) Department of Geography, Texas State University	2013
Graduate Teaching & Research Assistant Department of Geography, Texas State University	2009-2012

### C. Past research/scholarship support

Principle Investigator (PI), “A GIS for Cancer Disparity Reduction”, Scholarly Excellence Funds, South Dakota State University, \$12,300, 11/01/2014-06/30/2016.

Doctoral student Personnel, “Air Pollution-Exposure-Health Effect Indicators: Mining Massive Geographically-Referenced Environmental Health Data to Identify Risk Factors for Birth Defects”, USEPA Science to Achieve Results (STAR) Program, with PI: F. Benjamin Zhan and Co-PIs: Jean D. Brender, Jing Yang, and Peter H. Langlois, \$499,987, 2011-2014.

Principle Investigator (PI), “Cervical Cancer Disparities in Texas”, Doctoral Research Stipend Award, Texas State University, \$1,820, 01/01/2013-12/31/2013.

### D. Current and Pending support

#### Current support

N/A

#### Pending support

Principle Investigator (PI), “A Geographically Targeted and Personalized Approach to Understand and Reduce Cancer Disparities”, Research Allocations Committee Funds, University of New Mexico, 11/01/2016-06/30/2018.

### E. Selected Peer Reviewed Publications

Lin, Y., Gong, X., and Mousseau, R. 2016. Barriers of Female Breast, Colorectal, and Cervical Cancer Screening Among American Indians—Where to Intervene? *AIMS Public Health* 3 (4): 891-906

- Lin, Y.**, and Wimberly, M. 2016. Geographic Variations of Colorectal and Breast Cancer Late-Stage Diagnosis and the Effect of Neighborhood-Level Factors. *Journal of Rural Health*. (In press) Available at <http://onlinelibrary.wiley.com/doi/10.1111/jrh.12179/pdf>
- Gong, X., Brender, J. D., Langlois, P. H., **Lin, Y.**, and Zhan, F. B. 2015. Validity of the Emission Weighted Proximity Model in estimating air pollution exposure intensities in large geographic areas. *Science of the Total Environment* 563, 478-485
- Lin, Y.** and Gong, X. 2016. Risk Assessment of Water Pollution Exposure to Hazardous Waste Sites: A case study in Bexar County, Texas. *Papers in Applied Geography*. (In Press) <http://dx.doi.org/10.1080/23754931.2015.1116105>
- Zhan, F.B. and **Lin, Y.** 2016. Data Structure, Vector. *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology*. (In press)
- Lin, Y.**, Schootman, M., and Zhan, F. B. 2015. Racial/Ethnic, Area Socioeconomic, and Geographic Disparities of Cervical Cancer Survival in Texas. *Applied Geography* 56: 21-28.
- Zhan, F. B\*. and **Lin, Y\***. 2014. Racial/Ethnic, Socioeconomic, and Geographic Disparities of Cervical Cancer Late-Stage Diagnosis in Texas. *Women's Health Issues* 24 (5): 519-527. [\*First authorship shared]
- Lin, Y.** and Zhan, F. B. 2014. Geographic Variations of Racial/Ethnic Disparities of Cervical Cancer Mortality in Texas. *Southern Medical Journal* 107(5):281-288
- Chow, T. E., **Lin, Y.**, Huynh, N. T., and Davis, J. 2012. Using Web Demographics to Model Population Change of Vietnamese-Americans in Texas Between 2000-2009. *GeoJournal* 77(1): 119-134.
- Chow, T. E., **Lin, Y.**, and Chan, W. D. 2011. The Development of a Web-based Demographic Data Extraction Tool for Population Monitoring. *Transactions in GIS* 15(4): 479-494.
- Lin, Y.** and Zhu, J. 2009. Research on a Large Amount of Image Visualization Based on Semantic Similarity. *Science of Surveying and Mapping* 34(6): 150-152. (In Chinese)
- Chow, T. E., Ngu, A. H. H., **Lin, Y.**, Phillips, C., and Thornhill, S., 2012, Record linkage of web demographics as a GeoComputation challenge, Invited position paper in *GIScience 2012 Workshop on Role of Volunteered Geographic Information: Quality and Credibility*. <http://web.ornl.gov/sci/gist/workshops/2012/documents/Chow,%20Tze%20Kiu%20-%20Paper.pdf>.
- Lin, Y.**, 2011, Risk Assessment of Exposure to Hazardous Waste Sites. In: *Proceedings of International Symposium on Remote Sensing and GIS Methods for Change Detection and Spatio-temporal Modelling (CDSM 2011)*. Hong Kong, China. December, 15-16.

## **Christopher D. Lippitt**

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### **PROFESSIONAL PREPARATION:**

**Master of Public Administration (in progress)**, University of New Mexico  
**Certified Mapping Scientist - Remote Sensing**, American Society for Photogrammetry and Remote Sensing, 2015

**Ph.D. Geography**, Joint Doctoral Program – San Diego State University & University of California, Santa Barbara, 2012

**M.S. Geographic Information Science**, Clark University Graduate School of Geography, 2006.

**B.A. Geography**, *w/High Honors, Magna Cum Laude*, Clark University, 2005.

### **APPOINTMENTS / WORK EXPERIENCE:**

Special Assistant to the Dean for Research: May 2016-present

University of New Mexico College of Arts and Sciences

1 University of Mexico, Albuquerque, NM 87131

Responsibilities: Coordination of interdisciplinary research, including design of new state-of-the-art interdisciplinary science facility

Assistant Professor: August 2012-Present

University of New Mexico Department of Geography and Environmental Studies

1 University of New Mexico, Albuquerque, NM 87131

Responsibilities: Director: GI Science for Environmental Management (GEM) Lab, GI Science instruction, Lead Principle Investigator (Lead-PI) on remote sensing projects funded by: USDOT CRS&SI, NSF – IMEE, & BLM.

Founder and Board Member: November 2007-2015

TerraPan Labs LLC.

330 A St., Suite 29, San Diego, CA 92101

Responsibilities: System architecture, Hardware Design, Business Development, Proposal development, Project Architecture, Report Review.

### **SELECTED AWARDS:**

Hexagon Geospatial Education Award (With Student Su Zhang), 2015, Hexagon Geospatial Inc.

Robert N. Colwell Memorial Fellowship, 2011, American Society for Photogrammetry and Remote Sensing

Award for Excellence in GIS and Remote Sensing, 2010, American Society for Photogrammetry and Remote Sensing Southwest Region

Inamori Fellowship, 2009-2010, Awarded by the Inamori Foundation at San Diego State University

Doctoral Student Scholarship Award, 2009, 2008, 2007, Awarded by United States Geospatial Intelligence Foundation

NASA-MSU Professional Enhancement Award, 2007, Awarded by NASA and Michigan State University

First Place- AAG 2006 Geographic Information Systems and Science Specialty Group Honors Student Paper Competition, 2006, Awarded by Geographic Information Systems and Science Specialty Group

### **EXAMPLE PUBLICATIONS (Total = 49):**

\*Indicates a student mentee

## Books:

Lippitt, C.D., D.A. Stow, and L.L. Coulter. 2015. *Time-Sensitive Remote Sensing*. Springer Press

## Peer-reviewed Journals:

Stow, D.A., L.L. Coulter, C.D. Lippitt, G. MacDonald, R. McCreight, and N. Zamora. 2016.

Evaluation of Geometric Elements of Repeat Station Imaging and Registration.

*Photogrammetric Engineering & Remote Sensing* 82(10): 775-788.

Lippitt, C.D., D.A. Stow, and P.J. Riggan. 2016 Online. Application of the remote-sensing communication model to a time-sensitive wildfire remote-sensing system. *International Journal of Remote Sensing* Vol. 37 No.14, 3272-3292.

\*Zhang, S., S.M. Bogus, C.D. Lippitt, Giovanni C. Migliaccio. 2016 *Online*. Estimating Location-Adjustment Factors for Conceptual Cost Estimating Based on Nighttime Light Satellite Imagery. *Journal of Construction Engineering and Management*. DOI: 10.1061/(ASCE)CO.1943-7862.0001216.

\*Zhang, S. C.D. Lippitt, S. Bogus, P. Neville. 2016. Characterizing Pavement Surface Distress Conditions with Hyper-Spatial Resolution Natural Color Aerial Photography. *Remote Sensing* 8(5): 392.

\*Krofcheck, D.J., M.E. Litvack, C.D. Lippitt, and A. Neuenschwander. 2016. Woody Biomass Estimation in a Southwestern U.S. Juniper Savanna Using LiDAR- Derived Clumped Tree Segmentation and Existing Allometries. *Remote Sensing* 8(6), 453.

\*Kirk, Scott, A.E. Thompson, C.D. Lippitt. 2016. Predictive Modeling for Site Detection Using Remotely Sensed Phenological Data. *Advances in Archeological Practice* 4(1), pp. 87-101.

\*Zhang, S., C.D. Lippitt, S.M. Bogus, A. Loerch\*, and J. Sturm\*. 2016. The Accuracy of Aerial Triangulation Products Automatically Generated From Hyper-spatial Resolution Digital Aerial Photography. *Remote Sensing Letters* 7 (2):160-169.

Lippitt, C.D. 2015. Remote Sensing from Small Unmanned Systems; a paradigm shift. *Environmental Practice*.

Lippitt, C.D., D.A. Stow and K. Clarke. 2014. On the Nature of Models for Time-Sensitive Remote Sensing. *International Journal of Remote Sensing* 35 (18): 6815-6841.

Stow, D.A., Y. Tsai, L.L. Coulter, and C.D. Lippitt. 2014. Detecting and Measuring Moving Objects with Airborne Repeat Station Imaging in Rapid Succession Mode. *Remote Sensing Letters* 5 (3), 213-220.

Stow, D.A., S. Toure, C.D. Lippitt, C.L. Lippitt, and C. Lee. 2012. Frequency distribution signatures and classification of within-object pixels. *International Journal of Applied Earth Observation and Geoinformation* 15, p. 49-56.

Coulter, L.L., D.A. Stow, Y.H. Tsai, C.M. Chavis, C.D. Lippitt, G.W. Fraley, R.W. McCreight. 2012. Automated Detection of People and Vehicles in Natural Environments Using High Temporal Resolution Airborne Remote Sensing. *Proceedings of the Annual Meeting of the American Society for Photogrammetry and Remote Sensing*. Sacramento, CA.

Lippitt, C.D., L.L. Coulter, M. Freeman, J. Lamantia\*, W. Pang\*, and D.A. Stow. 2012. The Effect of Input Data Transformations on Object Based Image Classification. *Remote Sensing Letters*, 3(1): 21-29.

## **SERVICE ACTIVITIES:**

**President**, Rio Grande Chapter of American Society of Photogrammetry and Remote Sensing (ASPRS)

**Regional Director**, Rocky Mountain Region of ASPRS

**Member of:** Transportation Research Board (2014), American Association of Geographers (2003), American Society for Photogrammetry and Remote Sensing (2005)

# Appendix H





**UNIVERSITY OF NEW MEXICO  
DEPARTMENT OF GEOGRAPHY  
AND ENVIRONMENTAL STUDIES**

**GUIDELINES FOR  
DEPARTMENTAL GOVERNANCE**

**Adopted by vote  
of the GES faculty  
(September 2016)**

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## **DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES**

This document describes the working protocol for the Department of Geography and Environmental Studies at the University of New Mexico. It provides both directives and guidelines for shared faculty governance in the Department, and it is updated periodically to reflect the evolution of faculty concerns and values. Policies adopted by the University of New Mexico always take precedence over this document whenever differences occur.

### **DEPARTMENTAL MISSION**

We are an energetic and revitalized department that is passionate about our teaching and research in human geography and the environment, and in Geographic Information Science. We provide innovative curricular programs that are relevant to current, real-world problems, and that are strongly coupled with our individual research expertise. This synergy is nurtured by our commitments to intellectual diversity, collegiality and scholarly excellence in coherent focus areas within the disciplines of geography and environmental studies.

The Department has the following goals:

1. To be an integral part of the workings and be an active contributor to the mission of the University of New Mexico.
2. To improve its recognition and reputation amongst departments of Geography and Environmental Studies in the region and nationally.
3. To maintain a high level of research and teaching.
4. To provide academic leadership at UNM, particularly in the areas of Geographic Information Science and environmental understanding.
5. To provide a comprehensive offering of degree programs including professional certificates, undergraduate majors and minors, and graduate degrees.

Achieving this mission requires effective teaching, excellent research, active participation in university governance, and leadership in professional associations.

### **DEPARTMENTAL GOVERNANCE**

#### **I. MEMBERSHIP**

- A. Membership in the Department of Geography and Environmental Studies includes the following academic ranks: Distinguished Professor, Professor, Associate Professor, Research Associate Professor, Assistant Professor, Research Assistant Professor and Lecturer.
- B. Faculty in the above categories, including those who have joint appointments with other units, shall be considered voting members of the department only if 50 percent or more of their budgeted salary is administered through the Department of Geography & Environmental Studies.
- C. Faculty members on leave from the department shall retain voting privileges in decisions on the retention or appointment of Chair and on amendments to this governance document.

## **II. MEETINGS**

- A. Meetings of the department faculty shall be held on a regular basis during the academic year, provided that department affairs require faculty discussion, consent, or decision-making. In the absence of stated agenda items, planned meetings may be cancelled.
- B. In addition to the regular meeting schedule, meetings may be called at other times by the Chair or by any two members of the faculty.
- C. The Department Chair will act as moderator of each faculty meeting, and the Associate Chair will serve as moderator in cases where the Chair is absent.
- D. Minutes will be recorded at each meeting alongside the agenda, to create a general record of attendance, actions taken, and vote tallies where applicable. In general, minutes will be recorded by the Department Administrator, except when personnel issues or other matters of a sensitive nature are discussed. Minutes will be reviewed and approved at the beginning of the subsequent meeting.
- E. Committee reports and recommendations will either be (a) submitted to the chair for inclusion on an upcoming faculty meeting agenda or (b) sent directly to the whole faculty by email and thereby proposed for the consent agenda at an upcoming meeting scheduled at least one week after the notice is provided. Any faculty member can request that items proposed for the consent agenda be moved to the regular agenda for discussion, as long as this request is made at least 24 hours before the scheduled faculty meeting.
- F. Meetings generally use a modified version of Robert's Rules of Order in that decision-making proceeds via motion, second, discussion, and call for consensus.
- G. Consensus decision-making is a strongly shared value and is the fundamental basis of the faculty's shared responsibility for departmental governance. When consensus cannot be reached on a motion, the agenda item will be tabled until the next scheduled meeting if at all possible. If no consensus can be reached in the subsequent meeting, or in cases where the item is time-sensitive and cannot be tabled, the meeting moderator will proceed to majority voting via Robert's Rules of Order.
- H. Votes will normally be taken by a show of hands, but any faculty member can request an anonymous written vote.
- I. Each year, the faculty will invite graduate students to nominate a representative to attend all faculty meetings. This representative will not vote but will otherwise be invited to participate fully, except when personnel issues or other matters of a sensitive matter are discussed.

## **III. ADMINISTRATION**

The administration of the Department of Geography and Environmental Studies is carried out by a combination of elected/appointed administrators and faculty committees. This section describes the expectations for all administrative positions, including Chair, Associate Chair, Undergraduate Program Director, Graduate Program Director, and the Coordinators for: Computing & Facilities, Physical Geography, Learning Outcomes Assessment, Website, Speaker Series, and Outreach. It is preferred that these positions are held by different faculty members, but it is possible that some positions may overlap. The expectations for each position are described below.

## A. DEPARTMENT CHAIR

The Chair of the Department of Geography and Environmental Studies will generally be a senior member of the department faculty. In case no senior faculty members are available to serve, the Dean of Arts and Sciences will be consulted for an alternative solution.

### *1. Selection*

The Chair is selected with the consent of the faculty and the Dean of Arts and Sciences. The voting members of the department's faculty will submit to the College Dean the name of their preferred candidate. If more than one candidate is acceptable to the faculty and is willing to serve, a list will be submitted to the Dean. These may be listed in order of preference. The Dean will accept or reject a single candidate. If there is more than one, the Dean will choose from among the candidates or refer the list back to the faculty. The candidate or list of candidates will be voted on during an open faculty meeting by secret ballot. The results will be forwarded to the Dean. The normal term of office for a Chair will be four years. A Chair is eligible to succeed him or herself if he or she so desires, the faculty members so indicate and the Dean concurs. The Chair shall be reviewed by the faculty and Dean annually.

### *2. Duties:*

- a) To serve as the chief administrative officer of the department. The Chair shall administer the operation of the department by implementing the policies established by the university, the college, and department faculty members.
- b) To be the official representative of the faculty to the University and to the wider community.
- c) To be the liaison between higher levels of university administration and the departmental faculty, responsible for ensuring both (1) adequate communication of administrative priorities and actions to the departmental faculty, and (2) proper reporting of departmental activities and decisions to the administration.
- d) To advocate for departmental resources at the College and University levels.
- e) To engage in strategic planning that supports the department's academic mission.
- f) To report regularly to the department, summarizing the business of his/her office and the business of department members. The Chair shall make available on a regular basis any information which he/she and/or the faculty deems appropriate to the efficient operation of the department.
- g) To recruit and nominate faculty for administrative and committee service.
- h) To propose course offerings and faculty teaching assignments, in consultation with the Curriculum Committee.
- i) To prepare budget requests and propose distribution of allocations, in consultation with the Budget Committee.
- j) To manage personnel issues, in consultation with the Associate Chair and Personnel Committee.
- k) To manage student complaints or issues, in consultation with the Undergraduate Program Director or Graduate Program Director, as appropriate.
- l) To provide pre- and post-tenure evaluations of faculty members each spring, in consultation with the Personnel Committee.

- m) To oversee annually the merit review and salary adjustment process, in consultation with the Personnel Committee.
- n) To prepare faculty hiring and retention plans, in consultation with the faculty as a whole.
- o) To manage the confidential personnel files of all faculty and staff members, in accordance with University policies.
- p) To recruit, hire, and supervise staff as necessary to manage the Department's administrative and academic operations.
- q) To provide a written evaluation of the Department Administrator and other staff for which the Chair is the direct supervisor each year according to University regulations.

### 3. *Notes*

In general, it is expected that the chair will work collaboratively and in consultation with the department's faculty committees and with its other elected administrators to enact governance policies. The department chair, however, bears final responsibility for ratifying all documents, decisions, and policies. The Chair is normally given a reduced teaching load each semester to offset the expected workload associated with effective administration of these functions.

## **B. ASSOCIATE CHAIR**

The Associate Chair plays a significant role in the administration of the department. In addition to the specific duties outlined below, the Associate Chair is also expected to serve informally as a liaison between the Department Chair and the faculty.

### 1. *Selection*

The Chair will recommend an Associate Chair to the faculty members who will then vote on the appointment in a written ballot. The term of office for the Associate Chair will be two years. An Associate Chair is eligible to succeed him or herself if he or she so desires, and the faculty members so indicate.

### 2. *Duties*

- a) To represent the department when the Chair is absent.
- b) To assist in the management of departmental operations when the chair is not available.
- c) To provide input to the chair on strategic initiatives.
- d) To serve as chair of the Personnel Committee, with direct responsibility for documenting the work and decisions of that committee.
- e) To provide input to the Chair on the annual pre- and post-tenure evaluations of all faculty, in consultation with the Personnel Committee.
- f) To implement annually the merit review process, in consultation with the Personnel Committee.
- g) To supervise the faculty mentoring program, in consultation with the Personnel Committee.
- h) To convene the Personnel Committee when necessary to advise the Chair on the appropriate resolution of personnel issues involving faculty or staff.

3. *Notes*

The Associate Chair is normally given a reduced teaching load in the spring semester to offset the expected workload associated with the effective administration of the Personnel Committee's annual review procedures.

**C. UNDERGRADUATE PROGRAM DIRECTOR**

1. *Selection:*

The Undergraduate Program Director shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

2. *Duties:*

- a) To recruit undergraduate students as majors and minors in the Department's degree programs.
- b) To conduct orientation and advising sessions for new students.
- c) To oversee communications between the department and undergraduate student body.
- d) To foster an active undergraduate student group.
- e) To review student petitions for program of study exceptions.
- f) To manage student complaints and issues in consultation with the Chair.
- g) To review the results of student learning assessment for the undergraduate programs.
- h) To make recommendations on strategic initiatives related to undergraduate programming.
- i) To oversee the departmental program for Undergraduate Honors.
- j) To serve as a member of the Curriculum Committee.

**D. GRADUATE PROGRAM DIRECTOR**

1. *Selection:*

The Graduate Program Director shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

2. *Duties:*

- a) To recruit graduate students.
- b) To oversee the graduate admissions process and facilitate review of graduate applicants by the committee of the whole.
- c) To conduct orientation sessions for new students.
- d) To allocate and oversee the use of graduate office space.
- e) To oversee communications between the department and the graduate student body.
- f) To review student petitions for program of study exceptions.
- g) To manage student complaints and other issues in consultation with the Chair.
- h) To review the results of student learning assessment for the graduate programs.
- i) To make recommendations on strategic initiatives related to graduate programming.
- j) To supervise Teaching Assistant assignments.
- k) To serve as a member of the Curriculum Committee.



## **E. COMPUTING & FACILITIES COORDINATOR**

### *1. Selection:*

The Computing & Facilities Coordinator shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

### *2. Duties:*

- a) To conduct regular assessments of teaching and research lab facilities, including hardware, software and physical infrastructure.
- b) To work with appropriate staff members and research faculty to plan and coordinate facilities maintenance.
- c) To prepare annually a budget proposal for purchase, maintenance and replacement of the department's computing equipment, infrastructure and facilities.
- d) To solicit and review faculty proposals for spending on instructional infrastructure and advise the budget committee regarding appropriate course fee expenditures.
- e) To communicate to the student body all decisions regarding the allocation of course fees.
- f) To serve as an ex-officio member of the budget committee.

## **F. PHYSICAL GEOGRAPHY COORDINATOR**

### *1. Selection:*

The Physical Geography Coordinator shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

### *2. Duties*

- a) To ensure basic coordination between the Physical Geography lab sections and lectures.
- b) To review and update lab materials and equipment on a regular basis.
- c) To supervise Teaching Assistants assigned to the Physical Geography labs.
- d) To ensure that student learning outcomes are assessed appropriately in all physical geography labs.
- e) To communicate with the curriculum committee regarding the scheduling needs of lab sections for physical geography.
- f) To prepare annually a budget proposal for purchase, maintenance and replacement of the department's physical geography lab equipment.

## **G. LEARNING OUTCOMES ASSESSMENT COORDINATOR**

### *1. Selection:*

The Learning Outcomes Assessment Coordinator shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

### *2. Duties*

- a) To collect and report data on student learning to the Curriculum Committee
- b) To assemble and submit all required assessment reports to the College and university

- c) To regularly review and revise assessment procedures, in consultation with the instructors of Gen.Ed. core courses and the directors of degree programs.

## **H. WEBSITE COORDINATOR**

### *1. Selection:*

The Website Coordinator shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

### *2. Duties*

- a) To maintain and update the departmental website, in consultation with appropriate staff.
- b) To produce an annual strategic plan regarding the potential evolution of web-based functions and communications to support departmental priorities.
- c) To work with the speaker series coordinator and outreach coordinator to promote departmental visibility & foster scholarly exchange.

## **I. SPEAKER SERIES COORDINATOR**

### *1. Selection:*

The Speaker Series Coordinator shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

### *2. Duties:*

- a) To recruit, host, and publicize speakers in the department's colloquium series.
- b) To provide input to the Budget Committee regarding the costs of speaker events and potential sources of external funding.
- c) To work with the website coordinator and outreach coordinator to promote departmental visibility & foster scholarly exchange.

## **J. OUTREACH COORDINATOR**

### *1. Selection:*

The Outreach Coordinator shall be appointed by the Chair of the department with the consent of the faculty and will serve for two years. The term is renewable.

### *2. Duties:*

- a) To work with the department chair on strategic initiatives related to the Department's relationship with other units and administrators on campus.
- b) To coordinate outreach programs in Albuquerque and New Mexico to generate a greater awareness of geography as a field of university study.
- c) To work with the department chair to develop relationships with alumni from both the graduate and undergraduate programs.
- d) To work with the speaker series coordinator and website coordinator to promote departmental visibility & foster scholarly exchange.

## **IV. COMMITTEES**

In addition to the appointments outlined above, the Department uses a simple committee structure to perform many duties related to academic and administrative affairs.

### **A. COMMITTEE OF THE WHOLE**

The Department of Geography and Environmental Studies will for some issues act as a committee of the whole.

1. The committee of the whole will review and provide recommendations on strategic initiatives reported by the chair and standing committees.
2. The committee of the whole will select applicants for acceptance to the graduate program and will make recommendations to the graduate program director concerning the priorities for graduate student funding.
3. The committee of the whole will also review and provide recommendations on all hiring plans and will provide detailed feedback to ad hoc hiring search committees for all faculty positions.

Most of the department's work, however, will be conducted in smaller committees, in which a subset of appointed faculty members make recommendations to the Chair or to the committee of the whole.

### **B. STANDING COMMITTEES**

Standing committees will be convened each year at the beginning of the fall semester. Each committee will report throughout the year to the faculty as a whole on their activities through a notice-and-consent model, in which committee recommendations are communicated to the entire faculty in advance of faculty meetings and simultaneously proposed for a consent agenda at an upcoming meeting scheduled at least one week after the notice is provided. Any faculty member can request that items proposed for the consent agenda be moved to the regular agenda for discussion, as long as this request is made at least 24 hours before the scheduled faculty meeting. In general, the Department Chair will refrain from acting on matters being decided or recommended by departmental committees until after the first faculty meeting during which discussion of the relevant committee decision or recommendation could have been raised, except where earlier action by the Chair is required to protect departmental interests. In that case, the Chair will make every effort to implement an expedited notice-and-consent procedure that enables faculty feedback on committee decisions and recommendations within a shorter timeframe.

The Department Chair may annually develop a charge for each committee, which the committee members will review, modify and adopt as they see fit in accordance with this document. Each committee will elect its own chair, unless otherwise specified below, and will determine annually its intended procedures for meeting format, meeting frequency, and decision-making. Committee members shall be appointed by the chair with the consent of the faculty, except as noted specifically below. In general, a term of committee service will last two years, but shorter and longer durations are also possible with the consent of the faculty. The Chair will propose each fall a set of committee appointments for faculty consent.

### *1. Curriculum Committee*

#### a) Selection:

The Curriculum Committee will include the Graduate Program Director, the Undergraduate Program Director, and a minimum of one (1) additional appointed faculty member.

#### b) Duties:

- i. To review annually the curricula for all existing degrees, minors, and certificates and to recommend curricular changes to the committee of the whole for review and approval.
- ii. To engage in strategic planning for curricular development of new programs, in consultation with the faculty as a whole and to oversee the formal proposal process for any new programs that have the support of the faculty.
- iii. To review and provide recommendations to the chair on planned course schedules and faculty teaching assignments.
- iv. To solicit and review annually faculty proposals for new courses and course formats, providing direct feedback to the chair as to whether new or revised courses should be approved.
- v. To review all student petitions for exceptions to the program of study and to make decisions on whether each should be approved.

### *2. Budget Committee*

#### a) Selection:

The Budget Committee will include three (3) appointed faculty and the Computing & Facilities Coordinator as an ex-officio member.

#### b) Responsibilities:

- i. To solicit budget requests from all Directors and Coordinators on an annual basis.
- ii. To develop a list of budget priorities each year, and to submit this list to the chair as a guide for the development of the department's budget request.
- iii. To make recommendations to the chair on strategic planning for budgetary needs as well as on the development of new funding sources.
- iv. To review and provide feedback to the Chair on annual resource allocation plans.
- v. To solicit and review faculty feedback on budget plans and initiatives as part of the regular budget cycle.

### *3. Personnel Committee*

#### a) Selection:

The Personnel Committee will include the Associate Chair and two (2) additional appointed faculty. The Associate Chair will serve as chair of the committee.

#### b) Duties

- i. To implement the Department's mentoring program.
- ii. To review personnel management issues and provide advisory feedback to the chair on appropriate resolution strategies.

- iii. To conduct annual reviews of faculty performance, in accordance with University policy, and to provide judgments to the chair as to whether departmental standards for scholarship and workload have been met or exceeded by each individual faculty member.
- iv. To implement the annual merit review process and provide feedback to the chair about the relative performance of faculty members as a basis for salary adjustment.
- v. To regularly review and propose necessary revisions to the department's procedures for annual review of performance, workload, and salary.

### **C. AD HOC COMMITTEES**

Ad hoc committees will be convened periodically, according to the guidelines below. Members shall be appointed by the chair with the consent of the faculty.

#### *1. Promotion and Tenure Committee*

##### a) Formation:

The Promotion and Tenure Committee will be convened in the fall semester of each year in which a departmental faculty member is slated for one of the following milestone reviews: midprobationary review, tenure & promotion review, promotion review, or post-tenure review.

##### b) Composition:

- i. The Promotion and Tenure Committee shall consist of all tenured faculty members in the department.
- ii. The Chair of the department will not be a member of this committee.
- iii. The committee members will elect their own committee chair.
- iv. In lieu of at least three eligible voting members, the Chair of the department with concurrence of the faculty and the candidate will appoint interim Promotion and Tenure Committee members.
- v. The Chair of the department will submit the candidate's file to the Promotion and Tenure Committee at least three weeks before the written evaluation has to be submitted by the Chair of the department to the College of Arts and Sciences.

##### c) Duties:

- i. Evaluate materials, review supportive documents, and make recommendations for the department on candidates for the third year review of non-tenured faculty members.
- ii. Evaluate materials, review supportive documents, and make recommendations for the department on candidates for promotion and tenure.

#### *2. Hiring Search Committee*

##### a) Formation:

A hiring search committee is convened whenever the Dean of A&S authorizes a new faculty search.

b) Composition:

- i. The Chair will, with the consent of the faculty, appoint a search Committee consisting of at least three faculty members from within the department, one graduate student, and one additional member from outside the department. Diversity in membership is a key factor in committee selection. Additional members will be added if necessary to achieve diversity.
- ii. The Chair appoints one of the three faculty members from within the department as Chair of the Search Committee.

c) Duties

- i. The Search Committee meets to write the job description and circulates this to the whole department for additional input. In addition the job description will be submitted to OEO for approval.
- ii. The Search Committee will advertise the job description widely, including in the AAG Newsletter.
- iii. The Search Committee will be responsible for the selection of candidates for interview and organizing the interviewee's schedules. Candidates will make at least one public presentation and all faculty members will be given an opportunity to meet with the candidates.
- iv. The Search Committee will seek input from all department faculty members on the acceptability of each candidate.
- v. The Search Committee will meet after all selected candidates have been interviewed and make a formal recommendation to the faculty members regarding acceptability of candidates.

## **V. STANDARDS AND EXPECTATIONS FOR GES FACULTY**

*(This section adopted by vote of the GES faculty on 14 January 2015.)*

In the Department of Geography and Environmental Studies (GES), standards and expectations for faculty performance are independently defined for three aspects of work effort: research, teaching, and service.

### **A. RESEARCH**

Faculty members in GES normally have appointments that identify research as the dominant component of professional work effort, normally specified as 40% of work effort. It is expected that faculty members, through consultation and coordination with the department Chair, maintain this level of effort throughout each reporting period. Lecturers and other faculty members whose appointment does not include research are not expected to conduct, publish, or present research.

It is expected that GES faculty will maintain an active research agenda, and that research products will be publicly available to the greatest degree possible. Scholarly productivity will be assessed in three areas of activity: publishing, seeking research funding, and presenting research publicly. Excellence in these areas of activity may be evident in the quality, impact, and/or quantity of research products. Faculty members who consistently do not meet departmental expectations for research may be assigned an increased teaching load, as described in section 2, below.

## 1. *Publishing*

### a) Minimum expectations for publishing.

All faculty with research appointments are expected to publish research findings actively, whether in printed or electronic formats. Given the breadth of geography and of environmental studies as fields of scholarly research, and the varying publication practices characteristic of subfields within geography and environmental studies, a range of media types are suitable for the publication of research findings. These media types might include, but are not limited to: research monographs, normally published as books; peer-reviewed journal articles; law-review journal articles; peer-reviewed book chapters; other types of journal articles and book chapters (such as book reviews or encyclopedia entries, and full papers in volumes of conference proceedings); maps; edited volumes, whether published as books or special journal issues; textbooks; data sets and/or databases; or substantial creative, interpretive, or popular works relevant to geography and environmental studies. Exclusions to this list are research summaries (such as abstracts published in volumes of conference proceedings), personal or informal web sites (such as blogs), practical exercise manuals for teaching applications, and news media editorials or opinion essays. Excluded publication types may be included in evaluations of other aspects of a faculty member's work effort.

The Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must exercise discretion in evaluating publication records, because attainment of minimum expectations may be evident through different numbers or types of combinations of publications depending upon the subfield of research in which a faculty member normally participates. Additionally, multi-year time periods should be considered in evaluating publication achievements because scholarly research productivity is in many cases cyclical due to the normal progression of research projects.

### b) Evidence of excellence in publishing.

Excellence in publishing is not certainly evident in the absolute number or length of publications; publication quality is at least as important as quantity. However, publication quality may be difficult to assess, especially within a short period after publication, which is a constraint imposed by the normally annual basis of faculty performance evaluation. Further, contextual information is necessary to identify excellence in publishing, such as: a) the relationship of a published work to other works published by the same faculty member; b) the number of authors listed on a published work; c) the role of the faculty member in the production of a multi-authored published work; and d) publication practices characteristic of relevant subfields within geography and environmental studies.

Given these considerations, some indications of excellence in publishing may include:

- the breadth, depth, and/or complexity of a given work; ***or***
- awards from professional organizations for particular publications or a broad body of work; ***or***
- publications in scholarly journals that have relatively high measures of impact (all impact measures are methodologically imperfect, but each provides some basis for comparing journals); ***or***
- number of citations of a particular publication (all measures of the number or quality

of citations are methodologically imperfect, but each provides some basis for comparing journals); or

- potential impact within a field of study, due to the novelty, originality, or scope of a particular publication; or
- number of publications, especially if the number substantially exceeds average output characteristic of scholars within relevant subfields of research.

Evaluation of the quality of a publication is inevitably subjective. The Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair, may require input from other faculty members (not including a faculty member under review) if the Committee and/or Chair do not have appropriate expertise to evaluate a publication.

In all cases, the Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must exercise discretion in evaluating excellence in publication because this may be evident through a combination of publication quality and quantity that is impossible to define in general terms.

## *2. Seeking research funding*

### a) Minimum expectations for seeking research funding.

The Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must exercise discretion in evaluating achievements in seeking research funding, because funding is not equally important in all fields within geography and environmental studies. Additionally, if a faculty member's current academic research projects are adequately funded for continuance, it may be unnecessary to seek research funding actively.

Given these considerations, minimum expectations in seeking research funding are necessarily qualitative:

- each faculty member must seek sufficient funding support to enable active pursuit of his/her research agenda; and
- each faculty member must seek and pursue opportunities to generate the indirect benefits possible through funding awards, such as funded graduate assistantships and overhead cost support; and
- any and all funding applications must represent genuine efforts to gain research support.

### b) Evidence of excellence in seeking research funding.

Excellence may be especially evident in the form of successful funding applications, but depending on a faculty member's field of research and years of experience as a faculty member, excellence may be shown even through unsuccessful funding applications. Multi-year evaluation periods should be considered in seeking evidence of excellence because any need to seek research funding is normally cyclical because the receipt of an award is normally followed by a period of funded research.

Additionally, several aspects of any individual application/award must be considered in evaluating evidence of excellence in seeking research funding, such as: a) the total amount



of the application/award; b) the total length of the funding period; c) the importance of funding within the relevant field of research; d) the complexity and/or collaborative nature of the application/award; e) the faculty member's proposed role (such as PI, Co-PI, consultant, etc.) in the proposed or funded research; f) the type and amount of indirect benefits of the application/award; g) the importance of funding support to the faculty member's research agenda; and h) the competitiveness of a funding program.

### 3. *Presenting research publicly*

In rare cases, a faculty member may be unable to present all or part of his/her research publicly, due to the topic and/or funding conditions of the research. In such cases, the Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must decide on an individual basis how to evaluate achievements in presenting research.

It must be specified that presenting research publicly is not the same as providing public education, such as through guest lectures, continuing education events, or similar outreach activities, in which the content of a public presentation is not directly focused on a faculty member's research agenda. Providing public education may contribute to a faculty member's service work effort.

#### a) Minimum expectations for presenting research publicly.

It is expected that all faculty members will present research publicly outside the UNM, primarily in professional venues. At least one presentation per calendar year is expected in any of the following venues and formats, listed in approximate descending order of significance:

- invited or peer-reviewed oral presentation at a national or international professional meeting; *or*
- invited or peer-reviewed presentation in a non-oral format (such as a poster or an abstract) at a national or international professional meeting; *or*
- invited or peer-reviewed oral presentation at a regional or local professional meeting; *or*
- non-invited or non-peer-reviewed presentation in any format at a national or international professional meeting; *or*
- non-invited or non-peer-reviewed presentation in any format at a regional or local professional meeting; *or*
- any public presentation in any format, such as through articles or editorials in popular news media, whether published in printed or electronic formats.

The Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must exercise discretion in evaluating research presentations, because other venues and formats of public presentation of research are possible, and because a faculty member's ability to travel to professional meetings may be constrained by factors beyond the faculty member's control.

#### b) Evidence of excellence in presenting research publicly.

The quality of individual research presentations may be difficult to evaluate, because many

presentations will not be viewed by any departmental faculty members other than the presenter. As a result, excellence may be most readily evident in the number of research presentations, and in the characteristics of the venue in which research is presented. Peer-reviewed and invited participation, national and international venues, and oral formats generally suggest greater excellence. However, the Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must use discretion in inferring the quality of any research presentation based on contextual factors.

## **B. TEACHING**

Tenure-track faculty in GES normally have appointments that identify teaching as a significant component of professional work effort, normally specified as 40% of work effort. Full-time Lecturers in GES normally have appointments that specify teaching as 80% of work effort. It is expected that faculty members, through consultation and coordination with the department Chair, maintain these levels of effort throughout each reporting period.

Expectations for other faculty categories must be determined on an individual basis in employment contracts, and in compliance with all applicable rules, guidelines, and policies.

### *1. Minimum expectations for teaching.*

Expectations for teaching are specified in relation to teaching load, accessibility to students, learning outcomes assessment, and teaching assessment and evaluation.

#### *a) Teaching load.*

All faculty members who have teaching appointments are expected to teach their assigned number of organized courses each year. Organized courses have regularly scheduled meetings with multiple students enrolled, and thus generate student credit hours. Faculty members are also expected to engage in additional instructional activities, which might generate credit hours (such as supervising students in independent study, honors research, and thesis research), or might not (such as advising students, and serving on graduate or undergraduate thesis committees). These additional instructional activities constitute part of a faculty member's teaching work effort and are taken into consideration in performance and workload evaluations (particularly recognizing that faculty members may engage in additional instructional activities in support of other academic units on campus). However, these activities do not replace the expectation to teach organized courses.

Additionally, it must be specified that providing public education, such as through guest lectures, continuing education events, or similar outreach activities, is not considered to contribute to a faculty member's teaching work effort. Providing public education may contribute to a faculty member's service work effort.

The standard teaching expectation for full-time tenure-track faculty with a 40% teaching appointment is four organized courses per academic year of three or four credit hours each, with a typical distribution of two courses during the fall semester and two courses during the spring semester. For full-time Lecturers with an 80% appointment the standard teaching expectation is eight organized courses per academic year of three or four credit hours each, with a typical distribution of two courses during the fall semester and two courses during the

spring semester. Courses taught during the summer semester or during intersession periods do not satisfy normal teaching expectations. This standard teaching load may be modified with the written approval of the department Chair, and the UNM College of Arts and Sciences (CAS), according to all applicable rules, guidelines, and policies.

Course preparation and delivery are together expected to comprise 75% of teaching work effort, or 30% of total work effort for full-time tenure-track faculty members. Additional instructional activities are expected to comprise 25% of teaching work effort, or 10% of total work effort for full-time tenure-track faculty members. For full-time Lecturers, course preparation and delivery are together expected to comprise 90% of teaching work effort, or 72% of total work effort; additional instructional activities are expected to comprise 10% of teaching work effort, or 8% of total work effort. The difference in expected composition of teaching work effort between tenure-track faculty and Lecturers reflects the influence research activity is expected to have on teaching:

- faculty with combined research and teaching appointments are expected to incorporate aspects of their research-based expertise in teaching, and thus require less time to prepare course materials and content; and
- faculty with combined research and teaching appointments are expected to participate in additional instructional activities, particularly those activities that support student training in research, to a greater degree than Lecturers (or other faculty with teaching-only appointments) because of the importance of professional mentorship in both undergraduate and graduate education.

Faculty members, including Lecturers, who have either a reduced or an increased teaching load should normally have a corresponding change in their teaching work effort corresponding to 10 percentage points per course. Thus, a faculty member who is on research leave during a semester should have an expected teaching work effort of 0% for that semester. However, any specified, percentage-point change in expected teaching work effort related to increased or reduced teaching loads must be determined through discussion among the effected faculty member, the Personnel Committee, the department Chair, and the CAS.

Common rationales for reducing teaching load are: a) formal leaves, including sabbaticals, identified in the UNM Faculty Handbook; b) administrative assignments (such as department Chair, or director of an academic unit); c) course releases for new hires and pre-tenure, tenure-track faculty; d) family-related leaves; e) course buy-outs (made possible through funded research grants, fellowships, or other sources of funding); and f) class size and credit hours (for classes with very high enrollment, or courses of more than four credit hours). Any actual reduction in teaching expectations for these or any other reasons must be agreed upon by the faculty member, department Chair, and the CAS, and must adhere to all applicable rules, guidelines, and policies.

Increased teaching loads may occur for two reasons. First, faculty members, including Lecturers, may seek increased teaching loads in order to focus work effort on teaching, if this is a verifiable professional strength. Second, faculty members who consistently do not meet departmental minimum expectations for research *and/or* service may be assigned increased teaching loads, at the discretion of and following consultation between the Personnel

Committee, the department Chair, and the CAS. Any actual increase in teaching expectations for these or any other reasons must adhere to all applicable rules, guidelines, and policies.

A faculty member whose normal in-load course is cancelled because of low enrollment or other circumstances will be expected to make up that course by teaching an additional in-load course during the same semester, or the subsequent semester. If a make-up course is taught during a subsequent summer semester or intersession period, the faculty member shall receive no additional compensation that may be normally associated with teaching summer or intersession courses.

b) Accessibility to students.

To ensure that students at all levels have the opportunity to learn directly from faculty members, and that all students have an opportunity to take courses from any faculty member, it is expected that full-time, tenure-track faculty:

- teach undergraduate students, primarily through organized courses, but also through credit-generating instructional activities;
- teach graduate students, primarily through organized courses, but also through credit-generating instructional activities;
- participate on undergraduate honors thesis committees, and graduate thesis and dissertation committees, particularly within the department but also in support of other academic units at the UNM;
- post and hold office hours for students, whether these are at regularly scheduled times or by appointment, and whether in person or through real-time (“live”) interaction via telephone, the Internet, or some other means;
- make reasonable attempts to respond to appropriate student inquiries in timely manners;
- make reasonable attempts to accommodate student learning needs, particularly in coordination and communication with the UNM Accessibility Resource Center; ***and***
- teach a minimum average of 60 students per academic year through organized course sections, and other credit-generating instructional activities, unless the faculty member has approved, reduced teaching expectations.

Expectations for accessibility for students are similar for Lecturers, although:

- emphasis should be placed upon undergraduate teaching;
- emphasis should be placed upon organized courses rather than additional instructional activities; and
- the minimum average number of students taught per year should be 120, reflecting the higher teaching load expected of Lecturers.

c) Learning Outcomes Assessment

All teaching faculty must contribute as necessary to departmental learning outcomes assessment. Not all courses are included in the departmental assessment plan, but all faculty are encouraged to assess learning outcomes in individual courses. For faculty who teach courses that are included in the departmental assessment plan, necessary contributions may include:

- collection of assessment data, as specified by the departmental Learning Outcomes Assessment Coordinator;
- reporting of assessment data to the departmental Learning Outcomes Assessment Coordinator;
- assistance in interpreting assessment data, in collaboration with the departmental Learning Outcomes Assessment Coordinator; **and**
- responding to requests for information from the departmental Learning Outcomes Assessment Coordinator.

d) **Teaching Assessment and Evaluation.**

All teaching faculty must participate in assessments and evaluations of teaching effectiveness. This means: a) in every course, faculty members must provide students the opportunity to evaluate teaching, particularly through the standardized, end-of-semester assessments provided by the CAS; and b) tenured faculty members must participate in department efforts to provide peer evaluations of teaching to non-tenured faculty.

Additionally, all teaching faculty are expected to achieve, on average for all courses during a reporting period, quantitative scores from student evaluations that are minimally equivalent to a score of three out of five, with five being the highest (best) rating. It is recognized that teaching evaluation systems and criteria change, so that achievement of this minimum expectation must be within the context of whatever evaluations system may be in effect for a particular reporting period.

The Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must use discretion in interpreting student evaluations, because: a) evaluation scores may be lower for large courses, all other factors being equal; b) evaluation scores may be lower for more technical courses, all other factors being equal; c) evaluation scores may be affected positively or negatively by factors beyond a faculty member's control (such as condition of teaching facilities, or availability of teaching assistants); and d) student evaluations do not provide a complete measure or estimate of teaching effectiveness. For non-tenured faculty, peer teaching evaluations will serve alongside student evaluations as means of assessing teaching performance.

e) **Evidence of excellence in teaching.**

Excellence in teaching may be evident in:

- awards for teaching excellence; **or**
- high quantitative scores on student evaluations; **or**
- highly positive written comments on student evaluations; **or**
- highly positive peer teaching evaluations from other faculty; **or**
- the development of new courses, or the adaptation of existing courses to new formats; **or**
- the adoption or development of new pedagogical techniques or technologies; **or**
- student achievements, such as the publication of a student's paper in the UNM 'best student essays' periodical/web site; **or**
- exceptional participation in instructional activities other than regular courses, such as

a large number of graduate or honors student advisees, or extensive instructional activities in support of other academic units.

The Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must use discretion in evaluating evidence for excellence in teaching, because: a) excellence may be evident in different ways depending on the manner and structure of course delivery (such as large lecture-based courses, smaller discussion-based courses, hybrid online/in-person courses, entirely online courses, and laboratory courses); b) factors beyond a faculty member's control may affect teaching effectiveness; and c) class size may affect student evaluations independently of teaching effectiveness.

### **C. PROFESSIONAL SERVICE**

Full-time, tenure-track faculty in GES normally have appointments that identify professional service as the minor component of total work effort, normally specified as 20% of total work effort. Full-time Lecturers in GES normally have appointments that specify service as 20% of work effort. It is expected that faculty members, through consultation and coordination with the department Chair, maintain this level of effort throughout each reporting period.

It is expected that professional service contributions are shared as equally as possible amongst faculty members at each rank. Professional service should be pursued within the department, within the UNM, and more broadly through local, state, national, and international efforts. However, service within the department is particularly important to ensure its effective and efficient operation and governance. In only rare cases may a faculty member meet his/her service expectations entirely or primarily through service outside the department.

#### *1. Minimum expectations for service.*

The minimum service expectations for all faculty are: 1) attend all faculty meetings, unless impossible due to professional travel or some other professional responsibility, or a major personal event; 2) participate actively in departmental governance; and 3) contribute generally to educational and professional outreach within and beyond UNM.

There are no additional service expectations for non-tenured, first-year faculty.

For non-tenured faculty, additional expectations for the second and subsequent years are that during the reporting calendar year the faculty member must:

- participate for two semesters as a member (or chair) in one departmental committee (Personnel Committee, Budget Committee, Hiring Committee, or a major ad hoc committee); **or**
- serve for two semesters as a titled Coordinator within the department (Computing and Facilities, Physical Geography Labs, Learning Assessment, Website, Speaker Series, or Outreach);  
**and**
- participate for at least one semester as a member (or chair) in one major campus committee; **or**
- serve for at least one semester as a leading, elected officer in a regional, national, or international professional organization (normally president, vice-president, secretary,

treasurer, or councilor); **or**

- show some other evidence of substantial community or professional service, such as through editorship of a peer-reviewed academic journal, organizing a major professional conference, providing peer reviews of journal articles or funding proposals, providing public education on topics not directly related to a faculty member's research agenda, supporting public education in some other manner, or providing expertise to a government agency.

The Personnel Committee and, ultimately, the department Chair must exercise discretion in evaluating service contributions by non-tenured faculty, because service contributions may be reduced to help improve research productivity or teaching effectiveness. Additionally, minimum service contributions may be evident through some combination of responsibilities not specified above, and many activities may be considered in the "some other evidence" category in addition to those listed above.

For tenured faculty additional expectations are that during the reporting calendar year the faculty member must:

- participate for two semesters as a member (or chair) in one departmental committees (Personnel Committee, Budget Committee, Hiring Committee, or a major ad hoc committee);
  - serve on the departmental Tenure and Promotion Committee, if this is convened;
- and**
- serve for two semesters in a titled role as Associate Chair, Graduate Program Director, or Undergraduate Program Director within the department; **or**
  - serve for two semesters as a titled Coordinator within the department (Computing and Facilities, Physical Geography Labs, Learning Assessment, Website, Speaker Series, or Outreach);
- and**
- serve for at least one semester (or the equivalent) as Chair of one major committee outside the department, at UNM or within a professional organization; **or**
  - participate for at least one semester (or the equivalent) as a member in three major committees outside the department, whether at UNM or within a professional organization; **or**
  - serve for the equivalent of two semesters as a leading, elected officer (normally president, vice-president, secretary, or treasurer) in a regional, national, or international professional organization; **or**
  - show some other evidence of substantial community or professional service, such as through editorship of a peer-reviewed academic journal, organizing a major professional conference, providing peer reviews of journal articles or funding proposals, providing public education on topics not directly related to a faculty member's research agenda, supporting public education in some other manner, or providing expertise to a government agency.

The Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must exercise discretion in evaluating service contributions by tenured faculty, because minimum contributions may be evident through some combination of service responsibilities not specified above, and many activities may be considered in the "some other evidence" category in addition to those listed above. Additionally, tenured

faculty may be asked by the department Chair or some other administrator at UNM to undertake major, ad hoc service tasks that reduce other service expectations. Finally, it may not be possible for all tenured faculty members to hold a titled role within the department during a calendar year.

In all cases, the minimum expectation is that a faculty member successfully completes all service duties, including compliance with deadlines and other requirements. Faculty members who consistently do not meet departmental minimum expectations for service may be assigned an increased teaching load, as described in Section 2, above.

Faculty who are awarded leave, a sabbatical, or are otherwise authorized to be absent from UNM during the reporting period are not expected to make service contributions for the semester(s) for which authorized absence has been granted. Regardless of leave status, all faculty are expected to generally contribute to educational and professional outreach as appropriate and possible.

## *2. Evidence of excellence in professional service.*

Excellence in professional service may be difficult to evaluate, because many service responsibilities entail administrative tasks whose work products are difficult to evaluate qualitatively. Additionally, the quantity (or number) of service responsibilities or titles may not accurately correspond to the quantity of service-related tasks. For instance, the demands of service as a member of some committees may be very low, while in other committees the demands may be very high. As a result, the Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair must use discretion in evaluating achievements in professional service.

Excellence in professional service may be evident in:

- awards for service from professional organizations; ***or***
- appointment to service positions by UNM administrators outside the department, or by other public officials; ***or***
- clear importance and/or impact of a service responsibility (such as chairing the CAS Tenure and Promotion committee); ***or***
- visibility of service responsibility (such as serving as an expert consultant to a public agency, or an elected officer of a national or international organization); ***or***
- resolving a longstanding or significant problem through completion of a service responsibility.

In some cases, the Personnel Committee, the Tenure and Promotion Committee, and, ultimately, the department Chair, may require input from other faculty members (not including a faculty member under review) or other individuals (such as UNM administrators or members of professional organizations) to identify evidence of excellence in professional service.

## **VI. ANNUAL EVALUATION OF FACULTY PERFORMANCE**

*(This section adopted by vote of the GES faculty on 14 March 2016.)*



Three forms of evaluation shall be conducted each year: annual review of work performance and goals; merit review for allocating merit-based salary adjustments; and workload reporting. These annual evaluation processes are distinct from the milestone evaluation processes for tenure, promotion, or post-tenure review.

**A. SUBJECT FACULTY**

All continuing faculty shall be subject to the annual evaluation processes described herein. This includes professors (at all ranks) and lecturers whose employment status is probationary, tenured, or continuing non-tenure-track. The Department Chair may choose to receive evaluation through the annual evaluation processes, with the exception of the merit review process (as described below), but normally the Chair is exempt from these evaluation processes.

**B. TIMELINE FOR ANNUAL EVALUATION PROCESSES**

Faculty evaluations shall be conducted annually. The period of evaluation and reporting is the calendar year. Specific deadlines shall be:

1. Before January 31 each year, each faculty member must submit to the chair of the departmental Personnel Committee an evaluation dossier, as described below. Annual evaluation processes for faculty members who fail to provide a complete dossier, or provide a complete dossier after January 31, may be delayed.
2. The Personnel Committee will begin evaluating faculty dossiers no earlier than February 1 annually, and will normally conclude its evaluations before March 1 by submitting an evaluation report to the Department Chair.
3. The Chair will complete the evaluation processes by reporting any required results to the College of Arts and Sciences (CAS) or other UNM administrative units if required. The Chair's reporting will normally be concluded before the end of the spring semester, depending on deadlines established by the CAS or other UNM administrative units.

Any changes to annual evaluation procedures or documents must be approved by the departmental faculty before the end of fall semester.

**C. REPORTING DOCUMENTS**

*1. Faculty dossiers*

Each faculty member shall provide in one evaluation dossier the information necessary to complete all three annual evaluation processes. Each faculty member shall annually submit an evaluation dossier to the chair of the Personnel Committee consisting of the following documents:

- a full curriculum vitae that summarizes professional work accomplishments in research, teaching, and service;
- a statement of professional goals for the current calendar year;
- a statement of self evaluation based upon goals set for the prior calendar year;
- a completed and annotated copy of the evaluation analytical table (described below and attached to the departmental governance document) that places all work products in the appropriate categories in the table, assigns point values to each work product, and provides justification as necessary or desired for the placement of and point values assigned to work products entered into the analytical table.

Additionally, all probationary faculty shall submit:

- copies of classroom materials, peer teaching evaluations, and other materials reflecting on teaching performance; and
- copies of scholarly works completed or submitted during the previous year and other materials reflecting on scholarly work.

Dossiers will be maintained in accordance with the Faculty Handbook in order to protect confidentiality (*see* Faculty Handbook C70: Confidentiality of Faculty Records).

a) Curriculum vitae

It is the responsibility of individual faculty members to ensure that the curriculum vitae accurately and fully records professional outputs and accomplishments. As much as possible, the format and contents of the curriculum vitae should be aligned with the analytical table described below and attached to the departmental governance document. This table identifies “work output categories”, which represent types of work product commonly produced by departmental faculty. The curriculum vitae should clearly and honestly describe all aspects of a faculty member’s professional work effort. This means the document should provide complete, accurate, and verifiable:

- i. bibliographic information for all publications;
- ii. date information for all items (including the semesters during which service or administrative responsibilities were undertaken);
- iii. information on all aspects of funding proposals submitted and of funding awards received;
- iv. information on public presentations of research;
- v. information on all service contributions, both within and outside the department;
- vi. information on any awards or recognitions received; and
- vii. information on any other professional work product.

The chair of the Personnel Committee and/or the Department Chair may request a faculty member to supply more complete information on, or to provide verification of, any item on the curriculum vitae if additional information is deemed necessary to conduct a fair evaluation. The curriculum vitae shall be used in all three yearly evaluations: annual review of work performance and goals; merit review for the purpose of allocating merit-based salary adjustments; and workload review.

b) Statements of annual goals and progress toward goals

Statements of annual goals and progress toward goals are self-assessments of professional work outputs and accomplishment. The statements included in each evaluation dossier shall be concise, normally no more than about 250 words each.

The statement of annual goals should realistically anticipate intended outputs and accomplishments for the current calendar year, in terms of research, teaching, and service. These intended outputs and accomplishments should relate clearly to recently past professional work efforts, and should provide evidence of a desire to continue a trajectory of professional achievement appropriate to a faculty member’s career stage.

The statement of progress toward goals should honestly evaluate the degree to which the prior year’s goals, in terms of research, teaching, and service, were achieved. The statement

should identify contextual factors and direct events that aided in or hindered the accomplishment of previously stated goals.

These statements shall be used in the annual review of work performance and goals.

c) Completed analytical table

A primary tool used in annual evaluations is the analytical table, described below and attached to the departmental governance document. As part of his/her evaluation dossier, each faculty member shall complete the analytical table based on his/her work output during the prior calendar year, in order to:

- ensure that the Personnel Committee receives notice for all work output items that the faculty member wishes to have included in his/her annual evaluations;
- recommend to the Personnel Committee where each work output item should be placed with regard to the categories listed on the table;
- propose a point value that should be assigned to each work output item; and
- provide information that the Personnel Committee may use to assign point values to work output items during its independent analysis of evaluation dossiers.

The work output categories in the analytical table are not exhaustive. The point values indicated for each work output category are recommendations only. However, individual faculty members, the Personnel Committee, and the department Chair should seek to maintain standard categories and point values to the greatest extent possible, so that evaluation reports are closely comparable between faculty members within an evaluation period, and so that evaluation reports from different years are as closely comparable as possible.

The assignment of point values to work products within the analytical table is inherently subjective. A purpose of the self-completion of the analytical table is for individual faculty members to justify as necessary or desired the point values assigned to individual work product items. In the appropriate column of the analytical table, each individual faculty member should provide brief explanations of the actual work effort, scholarly impact, or other characteristics of each work output item, for those items for which the individual faculty feels this information is necessary.

Specific limitations to material that may be entered into the analytical table are:

- i. The only publications that may be included are those that have been published in final form during the reporting calendar year. However, if a faculty member can report no publications, he/she may claim credit for potential publications that exist only in early stages of the publication process, as a means of demonstrating effort toward publishing research. These publications shall receive points as a group, not as individual works, as specified on the analytical table. If such potential publications are reported for one calendar year, the faculty member must provide a statement of progress and expected timeline to publication, and make available a copy of the potential publication(s). Any potential publication once reported may not again be reported until it is published in final form.

- ii. Funding awards may be included only for the year in which an award was received, and for each year in which funds are actually received.
- iii. For publications and research presentations, “peer reviewed” means that the pre-published manuscript or the presentation proposal has been evaluated by peer reviewers, that is, people who have broadly similar expertise and competency as the publishing or presenting researcher. Publications that are not peer reviewed normally include: book chapters or journal articles that are reviewed only by the volume editor; invited review articles, editorials, or letters in scholarly media; any publication in popular media; and most creative works that are published primarily for aesthetic value. “Law review” means a scholarly journal that is normally published by a law school or bar association.
- iv. Data sets and databases may be reported only if published in a dataset journal, or published as or on a searchable, publicly available Internet site.
- v. Non-load courses taught at the UNM or any other institution for additional remuneration (normally, courses taught during a summer session or intersession, or online) will not be included in presenting the number of credit hours or number of students instructed during a review period. However, such courses increase the number and/or variety of learning opportunities for students, and thus should be reported. The analytical table shall clearly and correctly identify all non-load courses taught at the UNM.

In all cases, analytical tables completed by individual faculty members and included in evaluation dossiers are only the recommendation of an individual faculty member to the Personnel Committee. The Personnel Committee shall independently evaluate all dossiers as described below; the consensus analytical tables produced by the Personnel Committee may not agree in whole or in part with the analytical tables completed by individual faculty members.

d) Peer teaching evaluations

Probationary instructors in the department, and tenured instructors upon request, receive peer evaluations each semester. Evaluation dossiers shall include full copies of all teaching evaluations received during the prior calendar year, regardless of the calendar year in which an evaluated course was taught.

These evaluations shall be used in the annual review of work performance and goals, and in the merit review for the purpose of allocating merit-based salary adjustments.

e) Materials reflecting on teaching performance and scholarly work

The annual review process enables probationary faculty to present material evidence of their scholarly work and teaching performance, and receive feedback on these materials from tenured faculty in the department. As part of the annual evaluation dossier, probationary faculty shall submit documentation such as:

- i. course materials including syllabi, assignments, and exams;
- ii. evidence of teaching trainings attended;
- iii. publications;
- iv. publications in review;
- v. funding awards received;
- vi. funding proposals submitted for competition;

- vii. papers, posters, or slide shows presented at professional meetings;
- viii. awards or recognition received; or
- ix. any other documentation of teaching performance or scholarly work.

The annual review process leads toward the tenure review process for probationary faculty. The annual preparation and submission of an evaluation dossier that includes such documents should contribute directly toward the completion of a tenure file.

## *2. Documents supplied by department*

In addition to the documents supplied in faculty dossiers, the department shall provide supplemental information for the Personnel Committee to use in its review process.

### a) Courses Taught and Course Enrollments

The Department Chair shall provide to the chair of the Personnel Committee a list of all courses taught in the department during the prior calendar year, including regular courses, independent studies (GEOG 491, 591), thesis credits (GEOG 597, 599), and internships (GEOG 493, 593). This list shall include for each course the name of the instructor of record, the number of credit hours assigned to the course, and the 21-day enrollment for the course.

### b) Graduate Thesis Committees

The Department Chair will provide a list of all graduate thesis committees in GES, using signed graduate committee forms from the departmental file to verify faculty service as committee chair or as committee member during the preceding year.

### c) Statement of Goals from Preceding Year

The Department Chair will provide a copy of each faculty member's statement of goals from the preceding year. These will be extracted from the archived individual dossiers that were submitted by each faculty member during the most recent Personnel Committee review. The Department Chair will not submit goal statements for new faculty members until the second annual review.

### d) Course Evaluation Data

The Department Chair will provide student evaluation data for every course, including both summary scores and written student comments, as collected in the standard package used by the UNM. The departmental annual evaluation processes shall use the "overall teaching effectiveness" rating from these reports as its primary numeric indicator of teaching performance. The overall instructor effectiveness rating shall be used to: a) identify one aspect of the achievement of minimum teaching expectations for departmental faculty (as defined in the faculty standards and expectations portion of the departmental governance document); and b) identify meritorious and less-than-meritorious teaching performance. In the first case, the achievement of minimum performance standards is an important component of the annual review of work performance and goals. However, student evaluations provide only one type of information in assessing the achievement of minimum performance standards, and other sources of information shall also be used in evaluating annual teaching performance. In the second case, student evaluations provide a measure of success in teaching performance that should be considered in identifying work efforts that should be either rewarded or rectified.

The information provided by the department shall be used in all three yearly evaluations: annual review of work performance and goals; merit review for the purpose of allocating merit-based salary adjustments; and workload review.

#### **D. COMMITTEE EVALUATION OF ANALYTICAL TABLE**

A source of information used in annual evaluations is the analytical table, attached to the departmental governance document as an appendix. Each member of the departmental Personnel Committee shall evaluate each dossier and complete the analytical table in order to:

1. identify instances in which a faculty member appears to have failed to meet minimum expectations, which is used in the annual review of work performance and goals;
2. produce a numerical score that contributes to the merit review process; and
3. produce a numerical score that is used in workload reporting.

The work output categories in the analytical table are not exhaustive. The point values indicated for each work output category are recommendations only. However, individual faculty members, the Personnel Committee, and the department Chair should seek to maintain standard categories and point values to the greatest extent possible, so that evaluation reports are closely comparable between faculty members within an evaluation period, and so that evaluation reports from different years are as closely comparable as possible. The assignment of point values to work products within the analytical table is inherently subjective, and the Personnel Committee and the department Chair must strive to provide fair and justifiable evaluation of every work product recorded in every evaluation dossier.

#### **E. EVALUATION PROCESSES**

The three annual evaluation processes are distinct yet share several components. The purpose of linking the evaluation processes is to minimize the administrative tasks required to complete the annual evaluation processes.

##### *1. Evaluation timeline*

First, each faculty member shall provide a complete evaluation dossier to the chair of the Personnel Committee before January 31 each year.

Second, the chair of the Personnel Committee shall determine whether each faculty member has submitted a complete dossier. If any faculty member has not submitted a complete dossier, the Personnel Committee chair will request any missing document(s). If missing documents are not supplied in a timely manner, the merit review process will continue, but the committee's report to the Department Chair will clearly identify any limitations to the report due to incomplete dossiers.

Third, the chair of the Personnel Committee shall review all dossiers in comparison to those submitted in previous years in order to identify any professional work products that have multi-year relevance within the annual evaluation processes. Specifically:

- a) authored research books are used in evaluations for a period of five years, including and beginning with the copyright year of the book;
- b) edited research volumes are used in evaluations for a period of four years, including and beginning with the copyright year of the volume;

- c) authored textbooks are used in evaluations for a period of four years, including and beginning with the copyright year of the book;
- d) large-format, original maps are used in evaluations for a period of three years, including and beginning with the copyright year of the map;
- e) edited special issues of scholarly journals are used in evaluations for a period of two years, including and beginning with the copyright year of the book; and
- f) peer-reviewed or law-review journal articles are used in evaluations for a period of two years, including and beginning with the publication year of the final version.

For faculty members who have such publications in their record, the chair of the Personnel Committee shall add to the faculty member's dossier a document that completely identifies each work with multi-year relevance, and that specifies which of the above categories each work shall be placed.

Fourth, the chair of the Personnel Committee shall consult with the department Chair to identify any approved changes to the expected work effort of any faculty member. Based on this consultation, the committee chair shall add to each faculty member's dossier a document that completely identifies the per annum expected work effort of the faculty member. Normal expected work effort for tenure-track faculty is 40% research, 40% teaching, and 20% service per annum. Any changes in expected work effort must be determined on a per annum basis. For example:

- a) a one-semester, one-course teaching release means that expected teaching work effort per annum (assuming a normal 40-40-20 load in the non-leave semester) is 30%, with a concomitant 10% increase in either research or service, depending on the terms of the release;
- b) a one-semester sabbatical means that the expected work efforts per annum (assuming a normal 40-40-20 load in the non-sabbatical semester) are 70% research, 20% teaching, and 10% service; and
- c) a one-semester leave without pay means that the expected work efforts per annum (assuming a normal 40-40-20 load in the non-leave semester) are 20% research, 20% teaching, and 10% service.

Fifth, the chair of the Personnel Committee will provide all members of the committee full copies of each dossier submitted (including incomplete dossiers). Each committee member shall independently evaluate each dossier, with exceptions made to avoid conflicts of interest. In particular:

- a) no faculty member shall independently evaluate his/her own dossier (although each faculty member will have completed an analytical table as part of his/her dossier); and
- b) no spouse shall evaluate his/her spouse's dossier.
- c) As a component of the committee analysis described below, Personnel Committee members may discuss the independent evaluations of their own dossiers.

Sixth, to avoid conflicts of interest, the committee chair shall provide full copies of relevant evaluation dossiers (that is, the dossiers of Personnel Committee members, and spouses of committee members) to a faculty member not on the Personnel Committee, who will review these dossiers and complete analytical tables for each. The purpose of this external review

is to avoid conflicts of interest and to ensure that all evaluation dossiers receive the same number of independent analyses.

## *2. Independent analysis of dossiers*

Every evaluator—that is, each Personnel Committee member and the external reviewer—shall conduct an independent analysis of each evaluation dossier. In performing his/her analyses, every evaluator shall be aware of the UNM Faculty Handbook section B1: Professional Activities of Faculty and Criteria for Evaluation. Every evaluator shall employ the principles embodied in the UNM Faculty Handbook in performing evaluations.

All evaluators shall complete their independent analyses with minimal delay, normally less than two weeks after having received the dossiers for review.

Evaluators shall fully analyze each evaluation dossier. If any evaluator requires further information, clarification, or verification of C.V. contents in order to conduct a fair and complete analysis of any dossier, he/she shall request this information from the chair of the Personnel Committee, who shall seek any necessary information directly from the relevant faculty member.

Evaluators shall carefully consider point values assigned to individual work products entered into the analytical table. The faculty standards and expectations section of the departmental governance document suggests general characteristics of evidence of excellence in research, teaching, and service. Due to the range and variety of research, teaching, and service efforts departmental faculty commonly undertake, more specific guidelines for assigning point values to individual work products are not feasible. The committee analysis of evaluation dossiers, described below, is expected to reduce the subjectivity inherent to the evaluation process.

An evaluator has completed his/her independent analysis when: a) he/she has considered all work output items listed on the curriculum vitae and analytical table completed by the individual faculty member; b) assigned point values in the analytical table to all work output items; c) assigned point values for teaching based on the 21-day enrollments in each course; d) assigned point values for teaching performance based on the “overall teaching effectiveness” score on the formal teaching evaluations; e) read the statements of work goals and progress toward work goals; and f) calculated summary scores for research, teaching, and service on the analytical table.

Importantly, point values indicated in the analytical table for research, teaching, and service are not inter-comparable. For example, a score of five points earned for research is not comparable to scores of five points earned for service or teaching. Additionally, summary scores based on these point values are indices of work effort, and are also not inter-comparable between research, teaching, and service.

All evaluators shall return their completed analytical tables to the chair of the Personnel Committee prior to the committee analysis of the dossiers.



### 3. *Committee analysis of dossiers*

The chair of the Personnel Committee shall convene a meeting of the committee after all evaluators have returned completed analytical tables. The purpose of this meeting is to reach consensus on the specific information on each faculty member that should be included in the committee's evaluation report to the Department Chair. In particular, the committee shall complete a consensus analytical table based on discussion of the individual evaluations. The consensus analytical table shall be included in the committee's evaluation report to the Chair.

Once the Personnel Committee has completed its consensus analytical tables, the committee must make specific decisions in relation to each annual evaluation process, and develop justifications for all decisions. The decisions are specified in the following subsections.

#### a) Annual review of work performance and goals

The committee must decide if any faculty members have failed to meet minimum expectations for research, teaching, and/or service. This decision shall be based upon:

- minimum expectations for faculty that are specified in the departmental governance document;
- scores generated through the independent analyses of evaluation dossiers; and
- statements of annual goals and progress toward goals provided in evaluation dossiers.

The minimum expectations described in the governance document are mostly general in form, but provide some specific criteria for identifying minimum performance expectations. The summary scores generated from the analytical table through analyses of evaluation dossiers represent indices that can serve as criteria for different levels of professional work performance, including the attainment of minimum performance expectations. In principle, the following summary scores indicate the achievement of minimum expectations:

- i. for research, for a 40% expected work effort, any score  $\geq 3$  (or 0.075 earned points per expected work effort percentage point) represents the attainment of minimum performance expectations;
- ii. for teaching, for a 40% expected work effort, any score  $\geq 12$  (or 0.3 earned points per expected work effort percentage point) represents the attainment of minimum performance expectations; and
- iii. for service, for a 20% expected work effort, any score  $\geq 2$  (or 0.1 earned points per expected work effort percentage point) represents the attainment of minimum performance expectations.

If the Personnel Committee finds that a faculty member has not achieved these specified scores, this does not automatically mean that he/she has failed to meet minimum expectations. The Personnel Committee must discuss every instance in which any faculty member does not achieve these specified scores, and decide if there are contextual factors, which may be identified in a faculty member's statement of progress toward annual goals, that suggest that a faculty member has met minimum expectations despite a non-attainment score. In any case, if the committee's has found analytical table scores that suggests that a faculty member has not attained minimum expectations, the committee must write a

statement that justifies its final decision that a faculty member has or has not attained minimum standards.

For instances in which committee members disagree on whether a faculty member has or has not attained minimum standards, the Personnel Committee must identify the source of discrepancy, and seek consensus on the decision. If no consensus can be reached, the committee's majority opinion shall be indicated in the evaluation report. In such cases, the evaluation report shall also indicate that the committee did not reach its decision through consensus.

b) Merit review for allocating merit-based salary adjustments

The merit review for allocating merit-based salary adjustments shall be conducted during all annual evaluation cycles, regardless the availability of a merit raise pool of funds.

The Personnel Committee must decide the categorical level (not monetary value) of recommended merit-based salary adjustment each faculty member shall be recommended to receive. This decision shall be based upon:

- i. minimum expectations for faculty that are specified in the departmental governance document;
- ii. analytical table scores generated through the independent analyses of evaluation dossiers;
- iii. statements of annual goals and progress toward goals provided in evaluation dossiers; and
- iv. peer teaching evaluations provided in evaluation dossiers.

If the Personnel Committee has decided that a faculty member has failed to meet minimum expectations for research, teaching, or service, through the process of annual review of work performance and goals (described in the previous sub-section), this faculty member shall not be eligible to receive a merit-based salary adjustment. However, all faculty members shall receive cost-of-living salary adjustments.

For all faculty who have met minimum performance expectations in research, teaching, and service, the Personnel Committee must assign each faculty member to a meritorious category. These meritorious categories are:

- *Meets minimum expectations*: Faculty in this category have met minimum expectations for research, teaching, and service.
- *Exceeds expectations*: Faculty in this category clearly exceed minimum expectations for research, teaching, and service by showing some distinction in the quantity or quality of professional work output.
- *Shows extraordinary accomplishment*: Faculty in this category clearly exceed minimum expectations for research, teaching, and service and have achieved clearly exceptional distinction in the quantity or quality of professional work output.

In its evaluation report to the Department Chair, the Personnel Committee must produce a written statement about every faculty member that identifies and justifies its decision to place each faculty member in a particular category.

For instances in which committee members disagree on the appropriate category to which to assign a faculty member, the Personnel Committee must identify the source of disagreement, and seek consensus on the appropriate category for the faculty member. If no consensus can be reached, the committee's majority opinion shall be indicated in the evaluation report. In such cases, the evaluation report shall also indicate that committee did not reach consensus on the specified category.

Funds available for merit-based salary adjustment shall be allocated as follows. First, all faculty members eligible for merit-based salary adjustments shall be allotted shares in the merit raise pool of funds:

- Each faculty member assigned to the category "*Meets minimum expectations*" shall be allotted one share.
- Each faculty member assigned to the category "*Exceeds expectations*" shall be allotted two shares.
- Each faculty member assigned to the category "*Shows extraordinary accomplishment*" shall be allotted three shares.

Second, available funds shall be divided by the total number of shares allotted, and each faculty member shall be recommended a salary adjustment equivalent in value to the number of shares he/she has been allotted.

If the University determines that faculty salaries will not be increased, or that the increase shall be limited only to cost-of-living adjustments, the Personnel Committee's reports will be filed to help determine appropriate allocation of merit-based salary adjustments in future years when applicable. The allotment of funds for faculty raises is described further below.

c) Workload reporting

The committee must decide the number of "load units" (a concept explained in the UNM Faculty Handbook section C100: Academic Load) each faculty member has carried during the reporting period. This decision shall be based upon:

1. analytical table scores generated through the independent analyses of evaluation dossiers; and
2. any relevant guidelines that may be given from the CAS or another UNM administrative unit.

As stated in the UNM Faculty Handbook section C100: Academic Load, the "typical" academic load is 23 load units, composed of 9 scholarly work load units, 9 teaching load units, and 5 service load units. However, the actual number of workload units per faculty member will likely vary in each of the three categories, within these ranges: 0-18 units for scholarly work; 0-18 units for teaching; and 0-10 units for service. All faculty members are normally expected to carry 23 total workload units through different combinations of load units from the three categories.

The Personnel Committee shall determine the raw number of workload units each faculty member has carried in the following manners:

- For research, a summary score on the evaluation analytical table of three equals nine scholarly work load units.
- For service, a summary score on the evaluation analytical table of two equals nine service load units.
- For teaching, each three-unit, regular course equals three teaching load units; each four-unit regular course equals three and one-third teaching load units.

The Personnel Committee shall adjust the raw number of workload units according to these guidelines:

1. For each one-course teaching release, the raw number of teaching load units shall be reduced by three (or three and one third). To account for this decrease in earned teaching load units, three load units shall be added to the raw score for scholarly work or service, based on the terms of the teaching release.
2. For faculty members that have greater than average (in comparison to the faculty group as a whole) productivity in terms of research, teaching, or service, additional workload units may be assigned to the faculty member in any category, in order to more accurately reflect actual workload.

Based on the adjusted number of workload units identified for scholarly work, teaching, and service, the total number of workload units shall be determined.

For instances in which Personnel Committee members disagree on the number of workload units to award a faculty member, the committee must identify the source of disagreement, and seek consensus on the appropriate number of workload units for the faculty member. If no consensus can be reached, the committee's majority opinion shall be indicated in the evaluation report. In such cases, the evaluation report shall also indicate that committee did not reach consensus on its assignment of workload units to the faculty member.

d) Determinations for variable workload policy recommendations.

Based on the evaluation processes in this section, the Committee will make recommendations to the Chair regarding whether to increase or decrease a faculty member's teaching load for the following year:

- If a faculty member "*shows extraordinary accomplishment*" in research based on the evaluation processes in this section, the Committee will recommend that he or she is eligible for course load reduction at the discretion of the Chair under the variable workload policy.
- If it is determined that a faculty member does not have an active research program based on the evaluation processes in this section, the committee will recommend that he or she be considered for a course load increase under the variable workload policy. An "active research program" will be determined qualitatively based on all of the information included in the faculty dossier as outlined in this section.

**F. EVALUATION REPORT OF THE PERSONNEL COMMITTEE**

*1. Contents of the report*

The Personnel Committee shall report its evaluation decisions to the department Chair in a written format. This report will clearly identify any limitations in the committee's

evaluations, including documentation of incomplete faculty member dossiers. Additionally, the report shall include as an appendix copies of the consensus analytical table completed by the committee.

The committee's evaluation report shall, for the purpose of the annual review of work performance and goals, include the following information:

- for each departmental faculty member, a statement whether the faculty member has attained minimum standards for research;
- for each departmental faculty member, a statement whether the faculty member has attained minimum standards for teaching;
- for each departmental faculty member, a statement whether the faculty member has attained minimum standards for service;
- for any faculty member who has been determined on an analytical table to have not attained minimum expectations, a statement that justifies the committee's final decision whether a faculty member has or has not attained minimum standards; and
- for any instances in which the committee did not reach consensus on its necessary decisions but instead reported the committee's majority opinion, a statement that identifies the point on which consensus was not reached.

The committee's evaluation report shall, for the purpose of the merit review for allocating merit-based salary adjustments, include the following information:

- for each departmental faculty member, a statement whether the faculty member is eligible for merit-based salary adjustment;
- for each eligible departmental faculty member, a statement placing the faculty member into one of the three meritorious categories;
- for each eligible departmental faculty member, a statement of the rationale for placing the faculty member in the relevant meritorious category;
- for each eligible departmental faculty member, a statement of the number of shares that the faculty member shall be allotted of the available funds; and
- for any instances in which the committee did not reach consensus on its necessary decisions but instead reported the committee's majority opinion, a statement that identifies the point on which consensus was not reached.

The committee's evaluation report shall, for the purpose of the workload reporting, include the following information:

- a completed copy of the workload reporting form (or other document) that may be required by the CAS and/or other administrative units at UNM; and
- for any instances in which the committee did not reach consensus on its necessary decisions but instead reported the committee's majority opinion, a statement that identifies the point on which consensus was not reached.

## *2. Circulation of aggregate performance indicators*

After the Personnel Committee's report is received and accepted by the Department Chair, an aggregate summary of faculty performance in research, teaching, and service will be circulated to the faculty. The purpose of this document is to make it possible for individual faculty members to ascertain how their own performance compares to the performance of

the GES faculty as a whole on key performance indicators. The subset of performance indicators to be aggregated and the methods of aggregation are shown below. Any changes to this list must be approved by faculty vote.

a) Research Indicators

- Number of publications appearing in review year (not including in press or forthcoming works)
  - Peer-Reviewed: minimum, maximum, median
  - Non-peer-reviewed: minimum, maximum, median
- Total dollar amount of grants in review year, regardless of share to GES faculty member
  - Submitted in review year: minimum, maximum, median
  - Awarded in review year: minimum, maximum, median
- Number of presentations given in review year, including international, national,
  - Invited or refereed: minimum, maximum, median
  - Contributed or non-refereed: minimum, maximum, median
- Overall research score, from the personnel committee review: minimum, maximum, median

b) Teaching Indicators

- Advising during review year
  - Total grad committees chaired in review year: minimum, maximum, median
  - Total advisees graduating in review year: minimum, maximum, median
- Instructor effectiveness rating from all student evaluations during review year
  - GES 100-level courses: minimum, maximum, mean
  - GES undergrad-only courses: minimum, maximum, mean
  - GES grad/undergrad courses: minimum, maximum, mean
  - GES grad-only courses: minimum, maximum, mean
  - All GES courses: minimum, maximum, mean
- Overall teaching score, from the personnel committee review: minimum, maximum, median

c) Service Indicator

Overall service score, from the personnel committee review: minimum, maximum, median

## **G. CONTESTS**

Although faculty members will not have direct access to the Personnel Committee report, any faculty member may contest the Personnel Committee's evaluation of his/her own performance, as reported in the chair's annual review letter, by making a written contest to the Department Chair.

## **H. DEPARTMENT CHAIR'S EVALUATION PROCESS**

The Department Chair shall annually review the annual evaluation report of the Personnel Committee as well as the individual dossiers submitted by each faculty member, seeking clarification from the Personnel Committee chair, other committee members, and from individual faculty members where necessary to ensure that complete, accurate, and fair information and analysis is included in the committee's evaluation report. The Department Chair

has final responsibility for providing individual faculty members with annual reviews of their performance, for adjusting faculty salaries each year in accordance with university guidelines governing cost-of-living increases and merit-based raises, and for reporting faculty workloads to the UNM administration. In all of these tasks, however, the Department Chair is expected to rely substantially on the findings of the Personnel Committee, as developed through the procedures described above.

*1. Annual review of work performance and goals*

The main purpose of written annual reviews is to notify each faculty member explicitly whether he/she has met minimum performance expectations in research, teaching, and service, based on the stated departmental standards for each category. It is not expected that the Department Chair's written review will depart substantively from the findings of the Personnel Committee, although clarifications or additional information received after the Personnel Committee completes its evaluation report may lead to a change in the overall finding of whether a faculty member has or has not met minimum expectations. In such cases, the Personnel Committee shall be asked to provide feedback to the Chair on this new information before the annual review is completed.

As described above, the Department Chair shall solicit comments from all tenured faculty members on the performance of pre-tenure faculty members, as reported in their individually submitted dossiers. The Chair shall use these comments as necessary and appropriate in writing the annual evaluations of pre-tenure faculty members.

The Chair shall write annual reviews for each faculty member in accordance with the required formats and timelines set forth in the Faculty Handbook and by the CAS, and shall subsequently request a meeting with each faculty member to discuss the findings of the annual review. Annual reviews of pre-tenure faculty shall explicitly address whether the faculty member is "on track" to meet departmental expectations at the time of the next scheduled milestone review and will provide substantive feedback on the faculty member's statement of goals for the coming year.

As stated in the UNM Faculty Handbook, faculty members have the right to rebut the findings of the annual review and to submit materials in support of any such rebuttal.

Once completed, written annual reviews shall be placed in the department's confidential personnel files for each individual faculty member.

*2. Salary Review and Merit-Based Adjustments*

In years when the UNM administration determines that funds are available for faculty salary increases, the Department Chair shall rely on the Personnel Committee's reports as a basis for allocating the merit-based portion of any increase. The Department Chair shall announce to all faculty members as soon as possible if a merit raise pool is available, and, if so, the size of the pool.

In years when a raise pool of funds is available, the raise pool shall be divided into two portions: one portion for cost-of-living raises, and one for merit-based raises. Cost-of-living

raises are normally set at 1.5 to 2 percent, and are often set by the UNM as a minimum salary increase. All faculty salaries shall be adjusted for cost of living, regardless of whether the faculty member met minimum performance standards in the categories of teaching, research, or service.

The remainder of the raise pool shall be allocated on a merit basis to only those faculty members who attained minimum performance standards in teaching, research, *and* service. The Department Chair is explicitly excluded from the departmental raise pool. Allocation shall be calculated as follows:

- a) The Department Chair shall review the Personnel Committee's calculation of faculty shares, making adjustments only in exceptional cases where it is necessary to account for clarifications or information submitted after the committee's evaluation report was completed. Any such adjustment in the assignment of shares shall be reported both to the Personnel Committee and to the individual faculty member concerned.
- b) Eligible faculty members shall then be allocated merit-based salary increases in strict accordance with the number of shares as assigned in the Personnel Committee's evaluation report (and as adjusted by the Chair).
- c) The merit-based portion of the raise pool shall be divided by the total number of shares generated by eligible faculty to determine a dollar value per share. If funds for merit-based salary adjustments become available after one or more year when no funding has been available, merit-based raises shall be determined based on the total number of shares assigned in the Personnel Committee's evaluation reports (and as adjusted by the Chair) for all faculty members during the unfunded year(s).
- d) Each eligible faculty member shall receive a salary increase that reflects the total number of shares multiplied by their dollar amount.
- e) Given that each share shall be set as a fixed dollar amount, rather than as a percentage, the total amount of each eligible faculty member's merit-based salary increase will not be mathematically tied to his or her existing salary.

In years when the Dean of CAS or the Provost of the University makes available additional funding to adjust faculty salaries for purposes of equity adjustment or faculty retention, the Chair shall determine such adjustments separately from either the cost-of-living or merit-based increases. In this event, the Department Chair shall announce to all faculty members the total amount of funds available and seek feedback from the Personnel Committee before determining salary adjustments and submitting the final adjusted faculty salaries to the CAS.

### *3. Workload reporting*

The Department Chair shall generally adopt the exact workload numbers determined by the Personnel Committee for purposes of reporting overall faculty workload to the UNM administration. Exceptions shall be discussed with the chair of the Personnel Committee and will generally be limited to across-the-board adjustments intended to ensure that the report meets administrative expectations above the department level.



## VII. CRITERIA AND PROCEDURES FOR TENURE & PROMOTION

*(This section adopted by vote of the GES faculty on 09 December 2015.)*

### A. CRITERIA

The Faculty Handbook outlines the categories in which faculty performance is evaluated for the purpose of tenure and promotion:

- Teaching
- Scholarly Work
- Service
- Personal Characteristics

The University's general expectations in each of these categories states that, “In order to earn either tenure or promotion or both, faculty are required to be effective in all four areas. Excellence in either teaching or scholarly work constitutes the chief basis for tenure and promotion. Service and personal characteristics are important but normally round out and complement the faculty member’s strengths in teaching and scholarly work” (Faculty Handbook B1: Professional Activities of Faculty and Criteria for Evaluation, *Approved by Regents December 8, 1998; Approved by Faculty December 7, 1998*).

These criteria are reflected in the GES’s Standards and Expectations for faculty that provide the basis for the annual review of each faculty member’s contributions each year (see Standards and Expectations for GES faculty, *adopted January 14, 2015*). For pre-tenured faculty, they also serve as guidance regarding progress toward tenure and promotion. These standards are reflective of the GES’s interpretation of the Faculty Handbook’s categories in which faculty performance will be evaluated.<sup>1</sup>

The annual review assesses faculty performance for research, teaching, and service, and GES uses the same criteria used in the promotion and tenure context to evaluate whether a candidate for tenure has (1) proven effective in the areas of teaching, scholarly work, and service and (2) demonstrated excellence in either teaching or scholarly work. Personal characteristics are not assessed annually but are discussed below.

GES is interested in the entire research record of the faculty member. However, the decision for tenure and promotion to associate professor is based primarily on work done since the completion of the PhD.

Promotion from associate to full professor is reserved for “individuals who have attained high standards in teaching and who have made significant contributions to their disciplines” (Faculty Handbook B.2.2.3). The Faculty Handbook further states: “Appointment or promotion to

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<sup>1</sup> Opportunities are provided for exceptions to established criteria. These must, however, be formally requested by the person under review, and approved by both the Chair of GES and a majority of the Promotion and Tenure Committee. In the case of joint appointments with other units on campus, other evaluative measures may apply as specified in the letters of appointment.

Professor represents a judgment on the part of the department, college/school, and University that the individual has made significant, nationally recognized scholarly or creative contributions to his or her field and an expectation that the individual will continue to do so.” In considering candidates for promotion to full professor, the GES will undertake a careful investigation of the candidate's accomplishments in teaching, scholarly work, and leadership.

### *1. Research*

In terms of research and scholarly work, faculty members in GES normally have appointments that identify research as the dominant component of professional work effort. It is expected that GES faculty maintain an active research agenda, and that research products will be publicly available to the greatest degree possible. Scholarly productivity is assessed in three areas of activity: publishing, seeking research funding, and presenting research publicly. Excellence in these areas of activity may be evident in the quality, impact, and/or quantity of research products.

#### a) Publishing

- i. Effective scholarly work is reflected in the publication of research findings whether in printed or electronic formats. Given the breadth of geography and of environmental studies as fields of scholarly research, and the varying publication practices characteristic of subfields within geography and environmental studies, a range of media types are suitable for the publication of research findings. These media types might include, but are not limited to: research monographs, normally published as books; peer-reviewed journal articles; law-review journal articles; peer-reviewed book chapters; other types of journal articles and book chapters (such as book reviews or encyclopedia entries, and full papers in volumes of conference proceedings); maps; edited volumes, whether published as books or special journal issues; textbooks; data sets and/or databases; or substantial creative, interpretive, or popular works relevant to geography and environmental studies. Exclusions to this list are research summaries (such as abstracts published in volumes of conference proceedings), personal or informal web sites (such as blogs), practical exercise manuals for teaching applications, and news media editorials or opinion essays. Excluded publication types may be included in evaluations of other aspects of a faculty member's work effort.
- ii. Excellence in publishing is not certainly evident in the absolute number or length of publications; publication quality is at least as important as quantity. Contextual information is often necessary to identify excellence in publishing, such as: a) the relationship of a published work to other works published by the same faculty member; b) the role of the faculty member in the production of a multi-authored published work; and c) publication practices characteristic of relevant subfields within geography and environmental studies.

Given these considerations, some indications of excellence in publishing may include:

- the breadth, depth, and/or complexity of a given work; or
- awards from professional organizations for particular publications or a broad body of work; or

- publications in scholarly journals that have relatively high measures of impact (all impact measures are methodologically imperfect, but each provides some basis for comparing journals); *or*
- number of citations of a particular publication (all measures of the number or quality of citations are methodologically imperfect, but each provides some basis for comparing journals); *or*
- potential impact within a field of study, due to the novelty, originality, or scope of a particular publication; *or*
- number of publications, especially if the number substantially exceeds average output characteristic of scholars within relevant subfields of research.

b) Research Funding

Funding is not equally important in all fields within geography and environmental studies. Additionally, if a faculty member's current academic research projects are adequately funded for continuance, it may be unnecessary to seek research funding actively.

- i. Given these considerations, expectations in seeking research funding include:
  - each faculty member must seek sufficient funding support to enable active pursuit of his/her research agenda; *and*
  - each faculty member must seek and pursue opportunities to generate the indirect benefits possible through funding awards, such as funded graduate assistantships and overhead cost support; *and*
  - any and all funding applications must represent genuine efforts to gain research support.

ii. Excellence in research funding.

Excellence may be especially evident in the form of successful funding applications, but depending on a faculty member's field of research and years of experience as a faculty member, excellence may be shown even through unsuccessful funding applications. Multi-year evaluation periods should be considered in seeking evidence of excellence because any need to seek research funding is normally cyclical and because the receipt of an award is normally followed by a period of funded research.

Additionally, several aspects of any individual application/award must be considered in evaluating evidence of excellence in seeking research funding, such as: a) the total amount of the application/award; b) the total length of the funding period; c) the importance of funding within the relevant field of research; d) the complexity and/or collaborative nature of the application/award; e) the faculty member's proposed role (such as PI, Co-PI, consultant, etc.) in the proposed or funded research; f) the type and amount of indirect benefits of the application/award; g) the importance of funding support to the faculty member's research agenda; and h) the competitiveness of a funding program.

c) Presenting research publicly

- i. It is expected that all faculty members will present research publicly outside the UNM, primarily in professional venues. At least one presentation per calendar year is expected

in any of the following venues and formats, listed in approximate descending order of significance:

- invited or peer-reviewed oral presentation at a national or international professional meeting; *or*
- invited or peer-reviewed presentation in a non-oral format (such as a poster or an abstract) at a national or international professional meeting; *or*
- invited or peer-reviewed oral presentation at a regional or local professional meeting; *or*
- non-invited or non-peer-reviewed presentation in any format at a national or international professional meeting; *or*
- non-invited or non-peer-reviewed presentation in any format at a regional or local professional meeting; *or*
- any public presentation in any format, such as through articles or editorials in popular news media, whether published in printed or electronic formats.

ii. Excellence in presenting research publicly.

The quality of individual research presentations may be difficult to evaluate. As a result, excellence may be most readily evident in the number of research presentations, and in the characteristics of the venue in which research is presented. Peer-reviewed and invited participation, national and international venues, and oral formats generally suggest greater excellence.

## 2. Teaching

Tenure-track faculty in GES normally have appointments that identify teaching as a significant component of professional work effort. Expectations must be determined on an individual basis in employment contracts, and in compliance with all applicable rules, guidelines, and policies. Expectations for teaching are specified in relation to teaching load, accessibility to students, learning outcomes assessment, and teaching assessment and evaluation.

### a) Teaching load

All faculty members who have teaching appointments are expected to teach their assigned number of organized courses each year. Organized courses have regularly scheduled meetings with multiple students enrolled, and thus generate student credit hours. Faculty members are also expected to engage in additional instructional activities, which might generate credit hours (such as supervising students in independent study, honors research, and thesis research), or might not (such as advising students, and serving on graduate or undergraduate thesis committees). These additional instructional activities constitute part of a faculty member's teaching work effort and are taken into consideration in performance and workload evaluations (particularly recognizing that faculty members may engage in additional instructional activities in support of other academic units on campus). However, these activities do not replace the expectation to teach organized courses.

Public education, such as through guest lectures, continuing education events, or similar outreach activities, is not considered to contribute to a faculty member's teaching work

effort. Providing public education may contribute to a faculty member's service work effort.

The standard teaching expectation for full-time tenure-track is four organized courses per academic year of three or four credit hours each, with a typical distribution of two courses during the fall semester and two courses during the spring semester. Courses taught during the summer semester or during intersession periods do not satisfy normal teaching expectations. This standard teaching load may be modified with the written approval of the department Chair, and the UNM College of Arts and Sciences (CAS), according to all applicable rules, guidelines, and policies.

b) Teaching Assessment and Evaluation

All teaching faculty must participate in assessments and evaluations of teaching effectiveness. This means: a) in every course, faculty members must provide students the opportunity to evaluate teaching, particularly through the standardized, end-of-semester assessments provided by the CAS; and b) tenured faculty members must participate in department efforts to provide peer evaluations of teaching to non-tenured faculty.

Additionally, all teaching faculty are expected to achieve, on average for all courses during a reporting period, quantitative scores from student evaluations that are minimally equivalent to a score of three out of five, with five being the highest (best) rating. It is recognized that teaching evaluation systems and criteria change, so that achievement of this expectation must be within the context of whatever evaluations system may be in effect for a particular reporting period.

Discretion in interpreting student evaluations is often necessary because: a) evaluation scores may be lower for large courses, all other factors being equal; b) evaluation scores may be lower for more technical courses, all other factors being equal; c) evaluation scores may be affected positively or negatively by factors beyond a faculty member's control (such as condition of teaching facilities, or availability of teaching assistants); and d) student evaluations do not provide a complete measure or estimate of teaching effectiveness. Peer teaching evaluations will serve alongside student evaluations as means of assessing teaching performance.

c) Evidence of excellence in teaching.

Excellence in teaching may be evident in:

- awards for teaching excellence; or
- high quantitative scores on student evaluations; or
- highly positive written comments on student evaluations; or
- highly positive peer teaching evaluations from other faculty; or
- the development of new courses, or the adaptation of existing courses to new formats; or
- the adoption or development of new pedagogical techniques or technologies; or
- student achievements, such as the publication of a student's paper in the UNM 'best student essays' periodical/web site; or

- exceptional participation in instructional activities other than regular courses, such as a large number of graduate or honors student advisees, or extensive instructional activities in support of other academic units.

Discretion in evaluating evidence for excellence in teaching is necessary because: a) excellence may be evident in different ways depending on the manner and structure of course delivery (such as large lecture-based courses, smaller discussion-based courses, hybrid online/in-person courses, entirely online courses, and laboratory courses); b) factors beyond a faculty member's control may affect teaching effectiveness; and c) class size may affect student evaluations independently of teaching effectiveness.

### 3. *Service*

Faculty in GES normally have appointments that identify professional service as the minor component of total work effort. For purpose of promotion and tenure, the Faculty Handbook notes that: "Service [is] important but normally round[s] out and complements the faculty member's strengths in teaching and scholarly work" (Faculty HandBookB1.2(b): Professional Activities of Faculty and Criteria for Evaluation).

#### a) Expectations in professional service

It is expected that professional service contributions are shared as equally as possible amongst faculty members at each rank. Professional service should be pursued within the department, within the UNM, and more broadly through local, state, national, and international efforts. However, service within the department is particularly important to ensure its effective and efficient operation and governance. In only rare cases may a faculty member meet his/her service expectations entirely or primarily through service outside the department. The expectations for all faculty are: 1) attend all faculty meetings, unless impossible due to professional travel or some other professional responsibility, or a major personal event; 2) participate actively in departmental governance; and 3) contribute generally to educational and professional outreach within and beyond UNM. There are no additional service expectations for non-tenured, first-year faculty.

#### b) Evidence of excellence in professional service.

Excellence in professional service may be difficult to evaluate, because many service responsibilities entail administrative tasks whose work products are difficult to evaluate qualitatively. Additionally, the quantity (or number) of service responsibilities or titles may not accurately correspond to the quantity of service-related tasks. Excellence in professional service may be evident in:

- awards for service from professional organizations; *or*
- appointment to service positions by UNM administrators outside the department, or by other public officials; *or*
- clear importance and/or impact of a service responsibility (such as chairing the CAS Tenure and Promotion committee); *or*
- visibility of service responsibility (such as serving as an expert consultant to a public agency, or an elected officer of a national or international organization); *or*
- resolving a longstanding or significant problem through completion of a service responsibility.

#### 4. *Personal Characteristics*

The Faculty Handbook states:

This category relates to the personal traits that influence an individual's effectiveness as a teacher, a scholar, researcher, or creative artist, and a leader in a professional area. Of primary concern are intellectual breadth, emotional stability or maturity, and a sufficient vitality and forcefulness to constitute effectiveness. There must also be demonstrated collegiality and interactional skills so that an individual can work harmoniously with others while maintaining independence of thought and action. Attention shall also be given to an individual's moral stature and ethical behavior, for they are fundamental to a faculty member's impact on the University. Information used in the objective appraisal of personal traits may be acquired from peer evaluations (e.g., letters of recommendation for new appointees, or written evaluations prepared by colleagues for promotions or for other departmental reviews) and must be handled with great prudence. By necessity, the category of Personal Characteristics requires flexibility in its appraisal (Faculty Handbook B 1.2.4)

It further states that, as with service "personal characteristics are important but normally round out and complement the faculty member's strengths in teaching and scholarly work" (Faculty Handbook B1.2(b): Professional Activities of Faculty and Criteria for Evaluation). GES does not have specific assessment criteria for personal characteristics. However, any behavior that deviates from the expectations outlined in the Faculty Handbook will be considered as a factor in any recommendation for tenure and promotion.

## **B. PROCEDURES**

### 1. *Promotion and Tenure Committee*

The Faculty Handbook outlines the procedures for Departmental Review and Recommendations for promotion and tenure (Faculty Handbook B4.3.1: Faculty Reviews, *Approved by Regents December 8, 1998; Approved by Faculty December 7, 1998*). The GES chair is responsible for overseeing the implementation of these procedures.

GES is a relatively small department, and the Promotion and Tenure Committee consists of all tenured faculty. Lecturers and pre-tenured faculty are welcome to attend meetings of the Promotion and Tenure Committee but will not be pressured to provide a substantive assessment and will not participate as a voting member. Similarly, only full professors will participate in decisions promoting faculty from associate to full professor.

The candidate's dossier will be divided into two sections:

- a) information provided and generated by the candidate (e.g. C.V., research and teaching statements, supplemental materials) and
- b) information provided and generated by the GES (including external letters, annual reviews, course evaluations, the Chair's letter, confidential personnel materials, etc.)

Section 1 will be made publicly available. Section 2 will be available only to members of the Promotion and Tenure Committee and the GES Chair (Faculty Handbook C70: Confidentiality of Faculty Records).

After a thorough review of a candidate's dossier, each member of the committee will provide a written assessment based on the criteria outlined above to the Chair. Upon receiving the written assessments, the Chair will then meet with the committee, facilitate a discussion based on the criteria set forth in section A, and oversee the voting process.

Although it is reasonable to expect continuity between the annual reviews and promotion and tenure decisions, the two processes are functionally independent. The Chair and the Promotion and Tenure Committee will carefully consider these annual reviews but are not bound by them.

## *2. Spouses*

The evaluation of spouses/domestic partners within the GES will be undertaken with special attention to the need for objectivity. If one spouse/partner is Chair, the Associate Chair will assume the duties of Chair when necessary. In all cases, each spouse/partner will recuse himself or herself from any evaluative decision about the other. The GES expects all members of the faculty to respect the confidentiality of evaluation processes and of all other normally confidential procedures or discussions.

## **VIII. CRITERIA AND PROCEDURES FOR REVIEW AND PROMOTION OF LECTURES**

*(This section adopted by vote of the GES faculty on 09 December 2015.)*

### **A. CONTINUING, NON-TENURE TRACK LECTURER APPOINTMENTS.**

Continuing non-tenure track faculty (e.g., Lecturer) appointments in the Department are guided by the same governance documents used for tenure-track faculty members. They are subject to meeting UNM Faculty Handbook minimum workload requirements, consistent with the terms of their individual appointments (e.g., specific teaching and service appointments). The UNM Faculty Handbook (section B 2.3) explicitly identifies non-tenure track faculty titles including Lecturers: "2.3.2 Lecturer Faculty may be appointed to the position of Lecturer I, II, or III. These appointments are for professionals with appropriate academic qualifications, who are demonstrably competent in the relevant areas of their disciplines. While not eligible for tenure, Lecturers in each numerical class may hold the rank of Lecturer, Senior Lecturer, or Principal Lecturer. (a) Lecturer I—The title used for individuals who have qualifications equivalent to teaching assistants or graduate students and who are not currently graduate students at the University in the same department as their academic appointment. (b) Lecturer II—The title used for qualified professionals who have completed all requirements except the dissertation for the terminal degree (or equivalent) in their fields of study and who are not currently graduate students at the University in the same department as their academic appointment. It may also be used for professionals who have the terminal degree but only limited experience in teaching or scholarly work, or for professionals who do not have the terminal degree but have extensive experience. (c) Lecturer III—The title used for qualified professionals who hold the terminal degree (or equivalent) in their fields of study and who have additional experience in teaching and scholarly work.



## **B. ANNUAL PERFORMANCE REVIEWS OF LECTURERS.**

### *1. The UNM Faculty Handbook provides:*

All Lecturers will have annual performance reviews, which should be conducted according to Section B: Academic Freedom and Tenure, 4.0 of the *UNM Faculty Handbook* and as specified in this document, as appropriately modified by each School, College, Department or equivalent to conform with each unit's standard faculty review processes and to reflect each unit's specific requirements for continuation and promotion of Lecturers. The annual review in the first year must be conducted in the spring, in time for the Chair to provide written notice to the Lecturer no later than March 31 whether the Lecturer's contract will be renewed. In the second and subsequent years, the review must be conducted in the fall, in time for the Chair to provide written notice to the Lecturer no later than December 15. The Department Chair's written notice to the Lecturer will be copied to the Dean for inclusion in the Lecturer's personnel file (Faculty Handbook, C190: Lecturer Annual and Promotion Reviews).

### *2. Criteria for Assessment*

In GES, Lectures will be assessed annually using standards used to faculty performance in teaching and service. Lectures are expected to achieve, on average for all courses during a reporting period, quantitative scores from student evaluations that are minimally equivalent to a score of three out of five, with five being the highest (best) rating. It is recognized that teaching evaluation systems and criteria change, so that achievement of this expectation must be within the context of whatever evaluations system may be in effect for a particular reporting period.

Discretion in interpreting student evaluations is often necessary because: a) evaluation scores may be lower for large courses, all other factors being equal; b) evaluation scores may be lower for more technical courses, all other factors being equal; c) evaluation scores may be affected positively or negatively by factors beyond a Lecture's control (such as condition of teaching facilities, or availability of teaching assistants); and d) student evaluations do not provide a complete measure or estimate of teaching effectiveness. Peer teaching evaluations will serve alongside student evaluations as means of assessing teaching performance. Excellence in teaching will be recognized using the same criteria used for faculty annual reviews.

Discretion in evaluating evidence for excellence in teaching is necessary because:

- a) excellence may be evident in different ways depending on the manner and structure of course delivery (such as large lecture-based courses, smaller discussion-based courses, hybrid online/in-person courses, entirely online courses, and laboratory courses);
- b) factors beyond a Lecture's control may affect teaching effectiveness; and
- c) class size may affect student evaluations independently of teaching effectiveness.

It is expected that annual reviews for Lecturers will be conducted by the Department Chair, with input from tenured faculty. All evaluations will take into account individual

appointments (e.g., teaching load) and other assignments (e.g., specific service appointments or duties).

In accordance with the Faculty Handbook, “if any performance review of a Lecturer on a one-year appointment produces a negative evaluation, the Chair may exercise the University’s discretion not to renew the Lecturer’s contract. Alternatively, the Chair may provide the Lecturer a written description of the areas in which the Lecturer must improve if she or he is to continue as a member of the faculty. The Chair and the Lecturer must both sign this document. The Lecturer may then be issued a one year contract, with the understanding that if concerns are not adequately addressed, this contract will not be renewed.”

### **C. OPPORTUNITIES FOR PROMOTION**

Opportunities for promotion will be provided in accordance with the Faculty Handbook. The promotion process may be initiated at the request of the individual in writing to the Department Chair in the preceding Fall semester prior to the annual year of any proposed promotion. The candidate would prepare a professional dossier for departmental review. The dossier would be due at the start of the subsequent Spring Semester, and the review would be conducted in that Spring Semester. Candidates would be free to include letters of support from any source, but the process would only include internal reviews. Specifically, the tenured faculty members would provide their individual written reviews of the dossier materials, and their support decisions, as requested by the Department Chair. The Department Chair would then summarize those reviews and the aggregate level of support and submit his or her written recommendation, along with the complete dossier (as supporting materials for the decision), to the Dean of A&S. Finally, the GES process for annual reviews and promotion decisions for continuing non tenure-track Lecturers are subject to any guidelines or rules set out by the College of A&S or the Provost’s Office at UNM.

## **IX. FACULTY MENTORING**

### **A. PURPOSE, MISSION**

Assistance from a well-respected mentor is an invaluable supplement to the guidance and assistance that a department chair provides during the early years at UNM. The purpose of the GES Faculty Mentoring Program is to assist incoming junior faculty to adjust to their new environment, succeed in their career goals, and develop a sense of belonging and membership within the Department and University.

This purpose is carried out through provision of a knowledgeable established faculty mentor, typically someone who is in the same type of position as the incoming faculty, who has achieved a long-term relationship (e.g., tenured, experienced lecturer) with the department and university.

For new incoming faculty appointed as Associate Professor or Professor, assignment of a mentor is less critical, but highly encouraged, to serve as a means of acclimating the new faculty member to GES and UNM.

The Department of Geography and Environmental Studies envisions the Department as a community where the value of diversity is recognized and where equal opportunity is afforded for all.

## **B. PROCEDURE**

### *1. Chair Responsibilities*

- a) The chair should inform new faculty about and ensure their attendance at UNM's new faculty orientation, which occurs each fall semester.
- b) The chair should advise new faculty on matters pertaining to academic reviews and advancement, although mentors are also encouraged to provide information to mentees based on their experience.
- c) The chair should ensure that mentors and mentees have current information on academic personnel process, department policies, graduate student advising, and so forth (e.g. Faculty Handbook, GES Policies and Procedures).
- d) During each semester that new faculty join the department, the chair should survey current faculty and ask for volunteers interested in mentoring new incoming faculty.
- e) Upon appointment of new faculty, Department Chair should appoint a volunteer mentor for the new faculty member.

### *2. Mentor Responsibilities*

A good relationship with a supportive, active mentor contributes significantly to a new faculty member's career development and satisfaction. Although the role of mentor is an informal one, it requires dedication and time.

- a) After assignment to a new incoming faculty member, the mentor should contact the new faculty member in advance of arrival at UNM.
- b) The mentor should meet with the new faculty member on a regular basis over at least the first two years, ideally, at least one or two face-to-face meetings per semester.
- c) Mentors should encourage open communication via email, telephone, office hours, and so forth.
- d) The mentor should provide informal advice to the new faculty member on aspects of teaching, research, service, junior faculty research funding, staff responsibilities, and so forth, or be able to direct the new faculty member to appropriate others (see E.3. Mentoring Content).
- e) The mentor should treat all dealings and discussions with mentee as confidential.
- f) There is no evaluation or assessment of the new faculty member on the part of mentor, only supportive guidance and constructive criticism.

### *3. Mentee Responsibilities*

- a) Mentees should encourage and attend scheduled meetings with mentors.
- b) Mentees should keep mentors informed of any problems or concerns as these arise.
- c) When input is desired for research or writing issues, mentees should leave sufficient time in the grant proposal or paper submission process to allow mentors time to review and critique drafts.
- d) Mentees should prepare key questions before each meeting, so that structured time with mentors is tailored to mentee's needs.

- e) Mentees should contact mentors between meetings should issues arise about which the new faculty member is unclear.
- f) Mentees should also access other established faculty members as informal mentors, as those faculty members' experience and expertise apply to issues that arise.
- g) E.3 New Faculty Mentoring Content (See Appendix A)

### **C. CONTENT**

Key areas of mentoring content should include, but are not limited to the following: responsibilities of involved parties; university and department structure, decision-making, resources, and staff roles; teaching requirements, expectations, and student supervision; service requirements, committee structure, and department expectations; annual review process; issues related to research, publication, conferences, and funding.

## **X. EMERITUS POLICY**

Retiring faculty members may be given emeritus status, in accordance with University policy. A majority vote of the voting faculty members is required.

## **XI. AMENDMENTS TO THIS DOCUMENT**

This Statement of Department Governance may be amended at any regular meeting of the department provided the specific amendment shall have been distributed in writing with the agenda of the meeting at least three days prior to the meeting. A 2/3 majority vote of the total voting faculty is required to amend this document. Written proxies, sealed and delivered to the Chair prior to a meeting will be allowed only when amending this document or when electing faculty.

## **XII. LIST OF DIGITAL APPENDICES**

*(available in the GES "Faculty Share" drive)*

### **A. DOCUMENTS INCLUDED WITHIN THIS GOVERNANCE DOCUMENT**

- Standards and Expectations for GES Faculty (included as Section V)
- Annual Evaluation of Faculty Performance (included as Section VI)
- Criteria and Procedures for Tenure & Promotion (included as Section VII)
- Criteria and Procedures for Review & Promotion of Lecturers (included as Section VIII)
- Departmental Program and Policies for Faculty Mentoring (included as Section IX)

### **B. DOCUMENTS EXTERNAL TO THIS GOVERNANCE DOCUMENT**

- Chair's policy on grant submission deadlines, 08.14.2015
- Policy Regarding the Election of Plan I or Plan II for M.S. Students, 09.14.2015
- Chair's clarification of faculty obligations during leave, 09.30.2015
- Variable Workload Policy, 04.28.2016
- Analytical table for annual reporting of work performance, 01.2016

# Appendix I

## **M.A. Geospatial Entrepreneurship**

Draft Curriculum 11/10/2016

### Program Description:

The Geospatial Entrepreneurship program trains the next generation of geospatial entrepreneurs and innovators. Geospatial technology is used in virtually every major economic sector and is currently experiencing rapid growth in both acquisitions and job creation. As the 3<sup>rd</sup> fastest growing job sector in the United States, the broad suite of technologies that make up geospatial (e.g., Geographic Information Systems, location based services, Remote Sensing) are expanding to and in many cases underpinning myriad new markets, including for example: oil and gas, transportation, public health, marketing, real estate, natural resource management, and defense and intelligence.

The program, which can be completed entirely online or through a combination of online and in person courses at the University of New Mexico, focuses equally on the two core areas implied by its name: geospatial technology and entrepreneurship. Coursework in geospatial technology is designed to foster a deep understanding of geospatial technologies and the roles they play in society and various industries. Coursework in entrepreneurship is designed to provide graduates with the skills to establish and manage corporate entities in the start-up phase, including product development, attracting and managing investment, marketing, team building and management, and exit strategy.

Through the University of New Mexico’s Innovation Academy, students are eligible to compete for incubation funding, space, and mentorship.

The program will initially be offered as an 18 credit graduate certificate, expanding to a 33 credit Master’s degree once approved.

### Learning Objectives:

- **A fluent understanding of the role of geospatial technology in major industry sectors**
- **A functional understanding of the technologies used to collect, store, analyze, and visualize Geographic Information**
- **A functional understanding of principles of Geographic Information**
- **A functional understanding of business planning and execution**
- **Awareness of various paths to market and exit strategies**

### Courses:

In addition to UNM Online course offerings, students can satisfy course requirements through Massive Open Online Courses (MOOC). The curriculum includes a required course in MOOC format called ‘Geospatial World’ offered through Coursera, which serves as a pre-requisite for most courses. In addition, a self-directed curricular course designed to allow students to gain the technical expertise of their choosing (GEOG 588) via a targeted curriculum developed in cooperation with the instructor.

### Certificate Requirements

Requirement	Course Options	Status at Launch of Degree
Required	GEOG 589 – Geospatial World	To be developed

	MGMT 557 – Launching and Entrepreneurial Business	Traditional
Geospatial Technology (min. 6 credits)	GEOG 585 – Internet Mapping	Online
	GEOG 581 – Introduction to GIScience	Traditional
	GEOG 524 – Advanced Topics in Remote Sensing (UAS)	Traditional
	GEOG 588 – Advanced Topics in GIScience	Traditional
	OILS 515 – Introduction to Spatial Data Management	Online
Entrepreneurship (min. 6 credits)	MGMT 511 – Technology Commercialization and the Global Environment	Online
	MGMT 512 – Strategic Management of Technology	Traditional
	MGMT 514 – Technological Entrepreneurship	Traditional
	MGMT 516 – Entrepreneurial Finance in High Technology	Traditional

#### Master's Degree Requirements

Requirement	Course Options	Status at Launch of Degree
Required	GEOG 589 – Geospatial World	To be Developed
	MGMT 557 – Launching and Entrepreneurial Business	Online
Geospatial Technology (min. 5 courses)	GEOG 585 – Internet Mapping	Online
	GEOG 581 – Introduction to GIScience	Online
	GEOG 524 – Advanced Topics in Remote Sensing (UAS)	Online
	GEOG 527 – Introduction to programming for GIS	Traditional
	GEOG 528 – Advanced Programming for GIS	Traditional
	GEOG 588 – Advanced Topics in GI Science	Online
	OILS 515 – Introduction to Spatial Data Management	Online
Entrepreneurship (min. 4 courses)	MGMT 501 – Data Driven Decision Making	Online
	MGMT 503 – Managerial/Cost Accounting	Traditional
	MGMT 506 – Managing People in Organizations	Traditional
	MGMT 511 – Technology Commercialization and the Global Environment	Online
	MGMT 512 – Strategic Management of Technology	Online

	MGMT 514 – Technological Entrepreneurship	Online
	MGMT 516 – Entrepreneurial Finance in High Technology	Online
	MGMT 522 – Managerial Marketing	Traditional
	MGMT 663 – Employment Law	Online
	MGMT 657 - Non-profit Management	Traditional



# Appendix J

## i. UP AND DOWN BUT NOT OUT – A HISTORY OF THE GEOGRAPHY DEPARTMENT AT THE UNIVERSITY OF NEW MEXICO

By Olen Paul Matthews, Bradley Cullen, and Robert Campbell<sup>1</sup>

Geography at the University of New Mexico has gone through a series of transformations. In the early days, geography courses were taught by faculty trained in other disciplines. When the first geographers were hired, they were in other departments, since no formal geography department was established until 1961. Prior to 1961, a minor was established and after WWII many regional courses were offered as a service function to the university. Once the Department was established, it went through several periods of expansion but was never able to maintain a critical size for long. When small departments lose a few key faculty members, they can be put at risk by Dean's looking for convenient ways to save money. Several periods of shrinkage reduced the Department to dangerously low levels. This required creativity on the part of the faculty to reinvent themselves in ways that would receive university support. These ups and downs are the story of the Geography Department at the University of New Mexico (UNM).

### **The Early Years—Geography without a Department**

Geography first appeared as an academic subject at the University of New Mexico in 1917. From that time on, it appeared and disappeared, sometimes as a 'minor,' sometimes as a 'division,' and, finally, in 1961 a department was established. Why it had such a fluctuating presence is anyone's guess. However, the discipline has had a similar history in other American universities. Because geography is both a physical and a social science, it is difficult to place in the rather rigid departmentalization that has characterized American institutions of higher learning. This dual personality has probably frustrated many a university administrator.

C. T. Kirk of the Geology Department offered four courses in 1917 that would normally be considered geography. They were *Climatology*, *Geography of New Mexico*, *Commercial Geography*, and *The Interpretation of Maps*. The year is so closely identified with the role of the United States in World War I that one assumes a relationship: interest in geography often picks up during a war. But it is also possible that Kirk had a strong interest in geography. Many early geographers, such as William Morris Davis, were geomorphologists (or physiographers) trained in geology departments.

In 1919, Robert W. Ellis replaced Kirk (both Ellis and Kirk received their training at the University of Wisconsin). Ellis continued to teach the *Geography of*

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<sup>1</sup> In 1986 Robert Campbell wrote a history of the UNM Geography Department (Campbell 1986). It survives as a small mimeographed copy in the Department's files. When asked to write a history of the Department, Brad Cullen remembered it. On examination the history had many parts that could be used without modification. Because Bob died in 1993, the other two authors of this article consulted with his 'family'. We were given permission to use parts of his earlier work and were told Bob would be pleased to have his name appear on this publication.

New Mexico and added a course on the *Geography of North America*. In 1929, Stuart A. Northrop (Yale) joined the Geology Department teaching courses in *Geomorphology* and *Geomorphology of the United States*.

In 1934, a significant change occurred expanding geographic offerings beyond the Geology Department. Donald Brand was appointed Professor of Anthropogeography and, shortly thereafter, Chair of the Anthropology Department. Brand was an early graduate of the University of California, Berkeley, where the Department was headed by Carl Sauer. The courses Brand taught all had a strong geographic component. For example, in 1934 he taught *Anthropogeography*, *Geography and Archaeology of New Mexico*, *Climatic Factors in Anthropology*, and *Cultural Geography of the World*. At that time, Anthropology was a fairly inclusive department also offering Sociology, Criminology, and Social Organization.

Meanwhile, other departments began offering courses that are generally considered geography or that have a strong geographic component. Geology listed courses in *Geography of North America* (a standard summer course for many years), *Meteorology*, *Conservation of Natural Resources*, and *Geomorphology of the United States*. In 1937, J. L. Bostwick, a geographer who had graduated from Columbia University, joined the Geology Department and began to offer a course titled *Principles of Geography*. Biology listed courses in *Plant Ecology* and *Physiographic Ecology*. Throughout the thirties, there must have been a demand for such courses, and it is rather astonishing that they were not pulled together in some form until 1941.

### The Geography 'Minor'

In 1941, probably in response to the war we would inevitably enter, geography offerings were brought together, administered by a committee chaired by Professor Brand, and described as a 'minor' in geography. The courses were:

<u>Department</u>	<u>Course</u>
Anthropology	<i>Anthropogeography</i>
	<i>Human Geography of New Mexico</i>
	<i>Climatology</i>
	<i>Races and Cultures of Europe</i>
Biology	<i>Cultural Geography: Old World</i>
	<i>Cultural Geography: Latin America</i>
	<i>Physiographic Ecology</i>
Economics	<i>Plant and Animal Geography</i>
	<i>Economic Resources</i>
Geology	<i>Geography of North America</i>
	<i>Principles of Geography</i>
	<i>Geomorphology</i>
	<i>Geomorphology of the United States</i>
	<i>Descriptive Meteorology</i>
Physics	<i>Meteorology</i>

The committee appointed to administer this program consisted of the people from the departments who taught the courses: Brand of Anthropology,

Northrop and Bostwich of Geology, Bell of Biology, Sorrell of Economics and Business Administration, and Holzer and Workman of Physics. As time went on, various courses were added to the minor: *Dynamic and Synoptic Meteorology* (1942), *Geography of the Pacific Area* (1942), *Economics and Trade of Latin America* (1943), *Maps and Charts* (1943), and *World Economic Geography* (1944).

In 1947, the 'minor' disappeared from the catalog, to be replaced in 1948 by three courses listed under the ambiguous title, "Geography – Not a Department." Under this rubric, it was explained that neither minor nor major was offered. The three courses listed were Brand's, but by that time Brand had left the university. So with the end of the war and Brand's departure, geography as a separate discipline disappeared for a time. As individual courses offered in other departments, however, it never disappeared.

### **Regional Geography--Introducing the 'Service' Function**

In 1950, Wilfrid Kelley, a graduate of the University of Michigan and an Assistant Professor of geology, was named 'coordinator' of a set of geography courses that would satisfy 'group requirements' in the College of Arts and Sciences. These courses did not constitute a major or a minor. They were:

*General Geography 1 and 2*

*North America*

*South America*

*Middle America*

*Economic Resources*

*Land Utilization*

*Cultural Geography: Old World and Cultural Geography of Latin America*

*General Geography 1 – Physical Geography*

The Physical Geography course counted toward the fulfillment of Group IV (Science and Mathematics, non-laboratory) requirements in the university. All of the other courses could be used to satisfy Group III (Social Sciences) requirements.

A new emphasis on regional courses is evident in this list. A pattern was established that continued for almost two decades. A reason for this shift in emphasis may be found in the 1953 catalog, which says that the geography curriculum was designed to meet the educational requirements for 'geography' in the U.S. Civil Service examinations. At that time, the Foreign Service examinations included a significant emphasis on places and place names. From the point of view of the professional geographer, an offering of largely regional courses makes a statement that the science is primarily descriptive and idiographic. It also brands the geography curriculum as basically one that provides services to other schools and disciplines – education, history, and political science, for example. It tends to emphasize factual information and downgrades geography as a science. In fact, the 'minor' group created at the beginning of World War II was more systematic and topical, and more scientific, and, therefore, more representative of modern geography, than the postwar 'group requirements' offered.

In 1952, geography became a 'division' in order to meet a growing demand for the subject, and this status continued for the next nine years. Changes in the size of the division and course offerings were not substantial over this period. By 1959, the curriculum included regional courses in Eastern Asia and Western Europe and two 'problems' courses to cater to students' interests not met by standard course offerings.

In 1955, Kelley was replaced by Burton L. Gordon. Gordon had taken his Ph.D. in geography at Berkeley, as had Brand. Three years later, Gordon was joined by Yi Fu Tuan, another Berkeley Ph.D. The emphasis on regional courses continued, although one wonders why Gordon and Tuan, educated in the same Carl Sauer tradition as Brand, did not introduce more systematic and topical courses. Tuan later commented that they believed regional courses would attract more students, and numbers were important. It is true that an emphasis on 'regional' education flourishes and declines cyclically, not only in geography departments but also in various kinds of 'institutions' and 'programs.' The mid-1950s was a period of growth in interest in foreign places.

Meanwhile, substantive courses of a geographic nature were still offered by other departments. Two courses, *Territorial Ecology* and *Geography and Conservation*, appeared in the Biology curriculum for many years, with the latter eventually moving to Geography. Geology continued to offer *Geomorphology* and *Geomorphology of the United States*. Economics offered *Introduction to Latin America* until 1963; it also cross-listed the geography course *Economic Resources* until 1964. Civil Engineering offered a number of drafting courses, as well as field mapping – courses frequently found in geography curricula. *Cartography*, an engineering course, was a Geography Department requirement from the mid-1960s until the mid-1970s.

### **Departmental Status**

Finally, in 1961 the division was advanced to the status of a department, and students could graduate with a major in geography. Gordon and Tuan constituted the entire faculty at first; in 1963 they were joined by Conrad Aub, a Cambridge graduate. The geography curriculum included two 100 level courses: *Physical Geography* and *World Geography*; two 200 level courses: *Physical Geography* and *Economic Geography*; four 300 level courses, all of them regions: *South America*, *Middle America*, *North America*, and *Western Europe*; two 400 level courses, one of which, *Conservation*, was taught in the Biology Department and the other was a *Problems* course; and a 500 level *Problems* course was also listed.

Requirements for the undergraduate degree in geography included the two introductory courses, *Physical Geography at the 200 level*, *Anthropology 101* and *Geology 101*, as well as eight upper division courses, including one *Problems* course; it was possible to substitute two upper division courses from other fields.



**Figure 1.** The three earliest members of the Department of Geography, University of New Mexico – from left to right: Burton L. Gordon, Yi Fu Tuan, and Conrad Aub.

Gordon, Tuan, and Aub did not stay long after the major was introduced. Gordon left at the end of the 1964-65 academic year and Richard E Murphy (Ph.D., Clark) was hired as Professor and Chair to replace him. Tuan left in midyear, 1965-66, and his courses for the second semester were taught by Elinore Barrett, who was at the time working toward a doctorate at Berkeley. She rejoined the faculty full time in 1969. Aub left in 1966.

The growth of geography as a separate discipline at the University of New Mexico began with Murphy's appointment as Chair. He had taught at Wyoming and Hawaii, where he had seen the two extremes of departments: one was small, providing only a service function; the other was large and well-established, offering the Ph.D. He envisioned the latter for the only institution of higher learning in New Mexico that offered a geography degree at the time.



**Figure 2.** Richard Murphy, Chair, Department of Geography, 1965-81.

### **The Boom Period – The Growth of a Modern Department**

Dean Trowbridge, who hired Murphy, and Dean Wollman, under whose administration a major expansion of geography took place, were interested in geography and very supportive. So in Murphy's first annual report, after he had been Chair for only one semester, he suggested a number of changes that would begin to move the Department away from solely a service function toward a substantive program emphasizing the science of geography. He recommended the following course changes be made as soon as possible:

- a. The addition of a course in *Political Geography* (his field);
- b. Replacing the advanced course in *Physical Geography* with a course in *Climatology*;
- c. The introduction of a six credit course in *Economic Geography* to replace the three credit course in *Economic Resources*; and
- d. The addition of a course in *Cartography*.

For the future, he recommended adding courses in regional physiography, urban geography, land use, arid lands, and more regional courses. Murphy was able to add two people to the faculty in the fall of 1966: Iven Bennett (Ph.D., Boston), whose specialty was Climatology, and Reynaldo Ayala (M.A., Southern Illinois).

Murphy moved quickly to establish a sound geography program. Within five years he had (1) added four more full time faculty members, (2) introduced a graduate program leading to the M.A. degree, and (3) systematized and greatly increased course offerings, including graduate level seminars. At the end of a decade (1975), the faculty had been increased to eight. The Department offered four introductory courses, ten regional courses, twenty-seven upper level topical courses, and six seminars. Courses were organized according to whether they were 1. introductory, 2. regional, 3. advanced courses in physical geography, 4. advanced courses in human geography, 5. advanced courses in geographical methodology, or 6. seminars, workshops, and problems. These courses, together with relevant courses from other departments, could be assembled in such a fashion that students seeking a major in geography could also to some extent emphasize one or another aspect of geography. These options included climatology, economic/urban, geomorphology, cartography, remote sensing, and urban and regional land-use planning. This program provided fundamental support for both the undergraduate and graduate degrees.

In 1966, Murphy, Bennett and Ayala were the only members of the Department. Beginning in 1968, additions were frequent: Rodman Snead (Ph.D., Louisiana State; geomorphology) in 1969 (Snead was a visiting professor in fall 1967 and returned full-time in spring 1969); Elinore Barrett (Ph.D. Berkeley; 1967 and returned full-time in spring 1969); Robert Campbell (Ph.D. Clark; psychological geography, philosophy of geography) in 1970; Delbert Dyreson (Ph.D., Denver; mathematical geography) in 1971. Thereafter, a somewhat greater shift in personnel took place, with some people leaving and others replacing them as is seen in Table 1.

Changes in personnel brought changes in program emphasis. The post-war 'quantitative revolution' in Geography arrived in New Mexico. Dyreson was the first to introduce quantitative methods; he was followed by Redfield and

Cullen, the latter also an economic geographer. Williams (who also has a strong background in mathematics) introduced urban and regional planning. Morain brought remote sensing and biogeography. Fitzsimons and King introduced the modern techniques and applications in cartography. Place brought a strong background in cultural ecology and the geography of economic development, particularly in Latin America. Thompson was a specialist in water resources management, emphasizing agricultural water use and drought impact—very relevant topics for New Mexico.

During this time, the Department developed a research and publication focus as the university changed into a major research institution. For example, Barrett published two volumes on land tenure and agricultural development in southwestern Mexico and a book-- *The Mexican Colonial Copper Industry*.

**Table 1.** Tenure Track and Official Appointments (1955-2006)

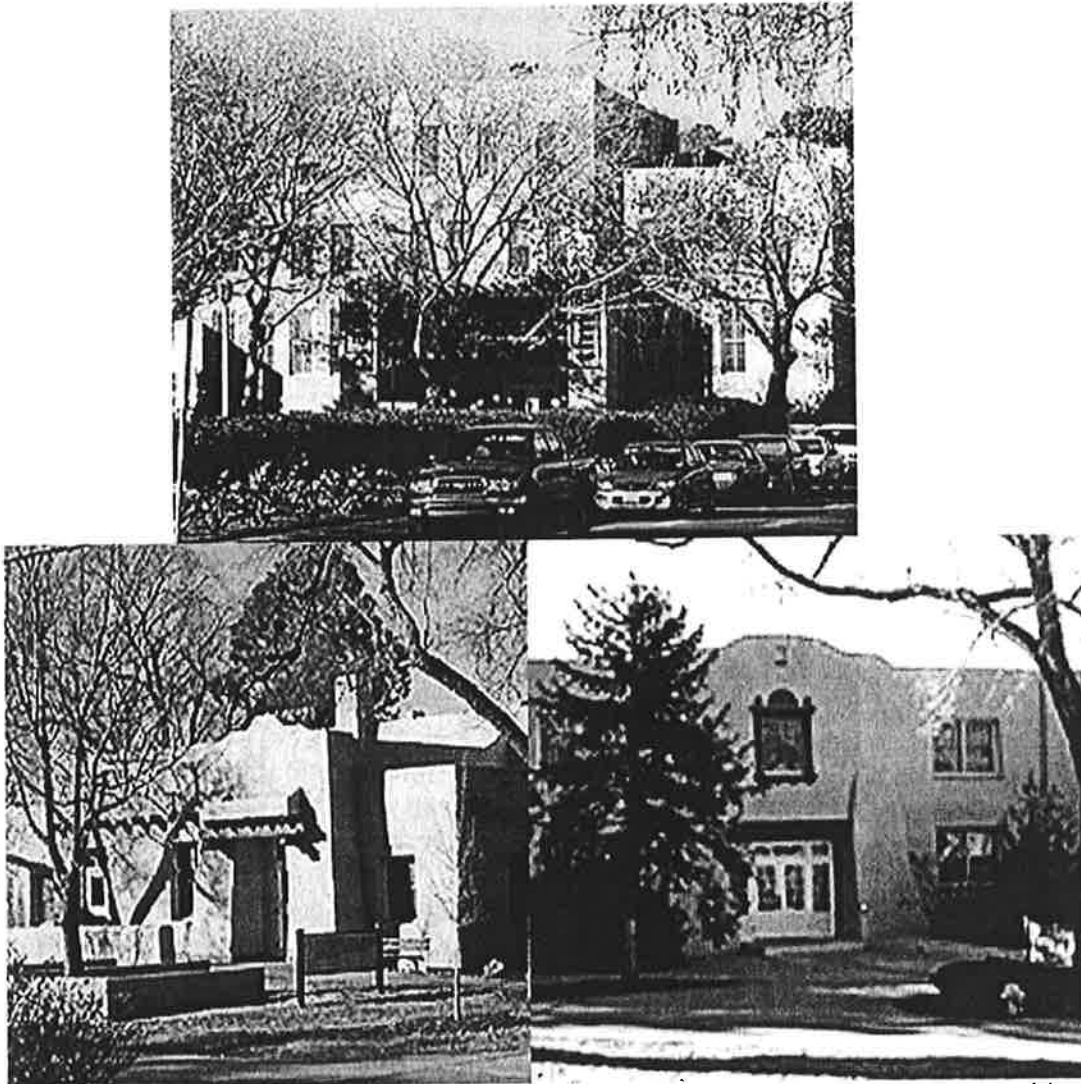
<u>Faculty Member</u>	<u>Field(s)</u>	<u>Joined Faculty</u>	<u>End Date/Current Status</u>
Burton Gordon Ph.D. Berkeley	Regional Geography	1955	1965
Yi Fu Tuan Ph.D. Berkeley	Regional Geography, Physical Geography	1958	1966
Conrad Aub Cambridge	Regional Geography	1963	1966
Richard Murphy Chair: 1965 - 81 Ph.D. Clark	Political, Europe	1965	1983
Iven Bennett Ph. D. Boston	Climatology, Southwestern U.S., North America	1966	1984
Raynaldo Ayala M.A. Southern Illinois	Latin American	1961	1968
Rodman Snead Chair: 1981 - 83 Ph.D. Louisiana State	Geomorphology, South Asia	1969	1995
Elinore Barrett Ph.D. Berkeley	Mexico, Cultural, Historical	1969	1993
Robert Campbell Ph.D. Clark	Psychological, Philosophy of Geography	1970	1980
Delbert Dyreson Ph.D. Denver	Mathematical, Systems Approach	1971	1973
Douglas Gordon A.B.D. Hawaii	East Asia, Cartography	1973	1978
Stanley Morain Chair: 1983-92; 2003-06?	Remote Sensing, Biogeography, Soils	1974	2006? Continues as EDAC Director



Ph.D. Kansas			
Wesley Redfield Ph.D. Indiana	Quantitative, Transportation	1975	1977
Jerry Williams Ph.D. Oregon	Urban, Land Use Planning, Africa	1977	Associate Professor
Alastair Shedden A.B.D. Berkeley	Cartography, Field Methods	1978	1981
Bradley Cullen Chair: 1992 – 95; 2001 - 02 Ph.D. Michigan State	Economic, Environmental, Marginality	1980	Professor
Dennis Fitzsimons Ph.D. Kansas	Cartography	1981	1984
Stuart White Ph.D. Wisconsin	Latin America	1982	1984 Currently Adjunct Professor
Susan Place Ph.D. UCLA	Latin America, Development, Cultural Ecology	1984	1988
Stephen Thompson Ph.D. Colorado	Water Resources Management	1984	1991
Guy King Ph.D. Utah	Cartography, GIS	1984	1988
David McGrath Ph.D. Wisconsin	Latin America	1988	1990
Louis Scuderi Ph.D. UCLA	GIS, Climatology	1994	2001
David Gutzler Ph.D. MIT	Meteorology Climatology	1995	1997
Olen Paul Matthews Chair: 1995 – 2001; 2002 -03; 2006 - ? Ph.D. Washington	Water Resources, Public Lands, Geography and Law	1995	Professor and Chair
Theresa Mulhern Ph.D. Maryland	Biogeography, Remote Sensing	1996	1997
Kirk Gregory Ph.D. Kent State	Water Resources, GIS	1998	2001
Seth Snell Ph.D. Boston	Climatology, GI Science	1999	2001
Richard Watson Ph.D. Texas	Remote Sensing, GI Science, Archeology	2004	Research Associate Professor
Danielson Kisanga Ph.D. Clark	GI Science, Environmental	2006	Instructor

Morain published a textbook titled *Systematic and Regional Biogeography*. Snead co-authored a book on coastal flood hazards and published two atlases. Williams published the second edition of his atlas, *New Mexico in Maps*. Bennett was co-author of *The Climate of New Mexico*. Faculty members at this time were active and productive.

Sometime in the early or mid-1970s, Murphy asked the faculty whether a doctoral program should be introduced. After considerable thoughtful debate faculty members declined, much to Murphy's disappointment. They argued that the resources for offering the Master's degree were barely adequate, and they were concerned that the considerable support needed for the doctorate would not be forthcoming. All members of the faculty very much wanted the Department to offer the degree; there was no question about that. But they saw the lack of laboratory equipment and space, the lack of proper facilities for a cartographic program, the lack of field equipment, and – of paramount importance—inadequate scholarships and fellowships as extremely inhibiting. In hindsight, this was probably a mistake. No one could have predicted the move to new space and the development of a modern cartography production lab. This occurred in 1982. Had the doctoral program been pursued at that time, the Department may have been able to withstand some of the problems that beset it later.



**Figure 3:** The Department of Geography moved from Hogan Hall (top, the oldest building on compass) to Bandlier East (lower left, Geography Laboratories) and Bandlier West (lower right, Geography and EDAC offices) in the early 1980s.

Murphy's long term as Chair ended in 1981 when he went to England on sabbatical. Tragically, Murphy died a few months after his return. Rodman Snead was made Chair in 1981 and served for two years until he left for a term as a visiting professor of geomorphology at the University of Otago, New Zealand. Snead was replaced by Stanley Morain. Morain was a part-time member of the Geography Department and the Director of TAC (Technology Application Center), a NASA funded center designed to transfer technology to the private and public sector. TAC was later renamed, becoming the Earth Data Analysis Center (EDAC).

In the early 1980s, faculty members voted to emphasize "applied geography." In part this was fortuitous, because there were already in place strong programs in cartography, photogrammetry, remote sensing, and land use planning. In part it was a response to the students of that time who wanted degrees that prepared them for career positions. Many other departments of geography were moving in that direction as well. One very tangible aspect of this commitment was Williams' creation of an internship program.

When Morain assumed the Chair, he was asked by the Graduate Dean to do a self-study in preparation for a graduate program review (Geography 1984). In 1984, when the self-study was completed, an outside review team was brought in to evaluate the Department (Lounsberry, Smith & Anderson 1984). Their report was positive, supportive, and encouraging. The self-study was updated in 1985 (Geography 1985). The two studies reveal a capable, dedicated, overworked and underpaid, forward-looking faculty, determined to push the growth of the Department to full professional status as soon as possible. It was felt by the faculty that the university's commitment to a strong and growing Geography Department would continue into the future.

### **Deans Make Rotten Decisions—First Crisis**

But the optimism of the early 1980s quickly faded. Assistant Professors Place and King both left the Department and took jobs at California State University, Chico. The reasons given were pay and expectations. UNM was a publish or perish institution with low salaries. Of its 18 self-identified peer institutions, UNM's pay scale was second to the bottom. In contrast, California State University, Chico had a unionized faculty with a set pay scale. Furthermore, teaching, not research, was the focus at Chico. Shortly after Assistant Professors Place and King left the Department, Assistant Professor Thompson was denied tenure, because his publication record did not meet expectations. These three losses devastated the Department, because it was not given permission to fill any of the vacant lines. The size of the faculty declined to 4.5 FTEs (Full Time Equivalents) partly because the Department lost the support of the College Dean.

In 1987, B.H. Wildenthal was hired as the new, outside Dean of the College of Arts and Sciences. As a result, the Geography Department was requested to develop a strategic plan. (Geography 1988). He was a physicist who could see the value of remote sensing and GIS, but failed to recognize the contribution that the field of geography could make to the college. The lack of departments of geography at most of the Ivy League institutions and universities such as Michigan, as well as poor grants-man-ship within the Department at UNM were used to justify the elimination of geography lines. When the university began a debate over 'reallocation,' one of the major foci of the discussion was whether or not the Department of Geography should be eliminated. Professor Barrett and Associate Professors Williams and Cullen defended the Department at various forums around campus. The Dean retaliated by assigning geography faculty to teach courses they has never taught before, as well as planning for the dispersal of geography faculty members. Associate Professor Cullen, for example, was to move to the College of Architecture and Planning; Associate

Professor Williams to the Department of American Studies; and Professor Morain to the Biology Department. The survival of the Department can be attributed to the lobbying efforts of Barrett and Cullen, and the departure of Dean Wildenthal. Barrett and Cullen were able to garner support for the Department from the discipline, alumni, and colleagues. Letters supporting the Department were written to the President, Provost, Dean, and Board of Regents. One very important supporter of the Department was the New Mexico State Senate. It passed, unopposed a memorial supporting the existence of a Department of Geography at UNM (New Mexico Senate 1992). When Dean Wildenthal left UNM to take a job at the University of Texas, Dallas, the Department was given a reprieve.

Professor William Gordon, the Chair of the Psychology Department, was appointed Interim Dean in 1992. One of his first acts was to appoint Associate Professor Cullen acting chair of the Department. Cullen was charged with developing a *Long-Term Development Plan* that would turn the Department around (Geography 1992). The *Plan* initially called for focusing the Department. Prior to the 1990s, courses and seminars in physical geography (climate, landforms, biogeography); human geography (economic, urban, resource management, conservation); and theory and methods (spatial organization, human-environment systems, location theory, cartography, GIS, remote sensing) were created for the Department's B.A. and M.A. students in order to provide them with the fundamentals of the discipline. The emphasis was on breadth with only limited scope for specialization. In 1992, the mission shifted to an emphasis on environmental analysis and geographic information science (GI Science). The new mission of the Department was to prepare students for more advanced degree programs and careers in those aspects of environmental analysis/resource management that were related to their background in physical geography, human/environment interaction, and GI Science.

In the early 1990s, the demand for individuals with a background in environmental analysis and GI Science was expanding rapidly. The conflict between society and the environment was possibly the most pressing issue facing humankind. Across the country, public opinion polls showed environmental issues near the top of people's concerns. Geography's long and rich tradition of focusing on human/environment interaction made the environmental debate a perfect focus for geographic research and teaching. As aptly put by Hansen in 1990: "Geographers bring to the study of environmental issues a synthetic, integrative view and an ease with complexity that others often lack." (Hansen 1990) We also brought a set of geographic techniques that facilitated the analysis of complex environmental problems. Great strides had been made in the development of geographically referenced databases and the analysis of remotely sensed data. But the application of these techniques to environmental problems was still in its infancy in the early 1990s. The Department of Geography at UNM wanted to help open this research frontier.

Besides the timeliness of the foci, there were pragmatic reasons for their selection. The environmental geography/GI Science foci interfaced well and complimented the Biology, Earth and Planetary Sciences, and Economics

programs at UNM. Even before the Department began to refocus its programs, many of its graduate students emphasized environmental analysis and GI Science in their M.A. programs. The great majority of them found employment related to their training, largely because of its applied nature. Contacts made through work at EDAC (formerly TAC) or an internship were helpful. Most of those who did not continue on to Ph.D. work found employment in New Mexico. The categories of employment for M.A. students between 1971 and 1990 are summarized in Table 2. During this 20 year period the Department of Geography produced 57 M.A. students or an average of 2.5 graduates per year.

**Table 2.** M.A. degrees and last known employment (1971- 1990)

<u>Category</u>	<u>Number</u>
Federal Agency	13
Consulting Firm/Business	11
PhD Program	7
College Faculty and Post Secondary Teaching	5
Local Government	5
University Research Facility	3
State Agency	2
K – 12 Education	2
National Research Lab (Sandia)	1
International Agency	1
Other/Retired/Unknown	7

Dean Gordon, who made a pledge to help rebuild the Department, embraced the *Long-Term Development Plan*. The following are some of the most important elements of his commitment: 1. Two lines for each line vacated through retirement; 2. Startup money for each new hire; 3. Return of the college's portion of all overhead generated for a period of 5 years; and 4. Funding for a GIT laboratory. At the end of the 1992-3 academic year, Professor Barrett retired, which opened up two lines. In the fall of 1993, the Department advertised for an Assistant Professor with a background in GI Science and physical geography, as well as a Chair, who also had a background in GI Science and physical geography. Louis Scuderi was hired into the Assistant Professor position, but the candidate selected to become the new Chair demanded untenable guarantees from the Dean. The Chair position was, therefore, not filled. The Department was the beneficiary, however, of a spousal hire in 1993. David Gutzler, a climatologist, was hired half-time in Earth and Planetary Sciences and half-time in Geography. But his appointment was delayed until fall, 1995.

In fall, 1994, the position of Chair of the Department was re-advertised, but with a new job description. In order to change the composition of the pool, the advertisement was broadened to encompass all environmental geographers, including those specializing in human/environment interaction. In spring, 1995, Olen Paul Matthews was hired to be the new Chair of the Department. During this period, a *Five-Year Plan* had been written by Cullen and approved by the

Department and Dean (Geography 1995). Professor Matthews was charged with implementing the *Plan*.

### **Rebuilding**

Matthews arrived in Albuquerque with strong commitments from Dean Gordon to rebuild the Department. New faculty members had been promised and a fairly substantial part-time faculty budget was provided until that could be achieved. The task of rebuilding was not simple, however. The Department had very few computers at this time and an anemic budget. A NSF undergraduate lab equipment grant had been written by Louis Scuderi in the 1994 -95 academic year with a promise of a 2:1 match by the University. The grant was successful and the equipment began arriving in the fall of 1995. The manual cartography lab was converted to a modern UNIX based computer lab. During the fall of 1995, Rodman Snead announced his retirement meaning the Department would have two new positions according to the Dean's earlier agreement. In January, Dean Gordon moved on to become the Provost, but his replacement, Michael Fischer (1996 – 2000), honored his commitments to the Department.

Because of budget difficulties within the university, only one of the positions was to be filled during the 1995-96 academic year. Theresa Mulhern, a biogeographer and remote sensor from Maryland, was the choice. Dr. Mulhern only stayed a year (1996-97) before taking a job at Kent State. One of her reasons for leaving was the lack of support in the Department's main office. The long-time Department administrator/secretary was placed on administrative leave in January of 1997 and could not be replaced until the administrative leave terminated. This placed a substantial amount of additional work on the Chair and faculty members.

During the summer of 1997, EDAC moved from their off campus location and began to share space with Geography. We also shared an accountant who spent about 10 hours a week on departmental affairs. The accountant and a work study student were the only staff in Geography's main office. When the accountant retired, the Department was faced with a choice: hire a full time department administrator or a half-time one. The advantage of the half-time position was that the difference in salary could be used for systems administration. The decision to use the NSF grant to build a UNIX system in the teaching lab also meant expensive fixes when the system broke down. The Department's budget had not been increased to cover these costs. The Department chose a half-time person and the position remained at that level until the UNIX system was replaced in 2001.

The commitment to hire two addition faculty members was honored, but it took time. In 1996 when Dr. Mulhern was hired the Department had grown to 7 faculty members (6 FTEs) with two being half-time (Gutzler and Morain). Mulhern left in 1997 and Dr. Gutzler asked to have his position moved full-time to Earth and Planetary Science. Dr. Gutzler was a climatologist but was not a geographer. He did not seem comfortable having social scientists as colleagues. By the summer of 1997, the Department was once again reduced to 4.5 FTEs. During the 1997 academic year, two things happened to improve this picture.

Stan Morain was made full-time in the Geography Department for the first time in his long stay at the University. This was in part looked on as a replacement for the half-time position lost when Dr. Gutzler left the Department. The second event was the search for a replacement for Mulhern. The Department concentrated on trying to find a physical geographer with modeling skills in GI Science. As a result of the search, Kirk Gregory was hired with a starting date in August 1998. Dr. Gregory's expertise was in water resources and GIS. During the 1998-99 academic year, the Department advertised for the last of the promised positions, seeking another physical geographer with modeling skills. In August 1999, Seth Snell joined the Department, bringing an expertise in climatology and GI Science. This put the Department at 7 FTEs.

One of the goals for the Department was to increase grant productivity. In 1998 with some of the new faculty on board, Department members began to look seriously for grants. The idea was to couple environmental modeling within a GIS context so that water transfers and their economic consequences could be examined. Five members of the Department were included with the unidentified prospective hire being penciled into the grants. To round out the research team, a groundwater hydrologist and three economists were added. To the great joy of the Department, both a NSF and an EPA grant were funded that year at a combined total of \$1.1 million. Thus in 2000, things were looking-up for the Department, and it seemed on the verge of takeoff. Five members of the Department were working as a research team. Although the need for part-time faculty members had not completely disappeared, it had been substantially reduced. The university's hiring commitment to the Department had been honored. Although some issues remained such as an anemic budget and a part-time department administrator, department members once again seemed optimistic about the future.



**Figure 4.** The faculty of the Department of Geography, 2000 (from left to right, Matthews, Williams, Snell, Scuderi, Gregory, and Cullen; missing Morain).



There was additional reason for optimism. During the 1999 – 2000 academic year, Dean Fischer agreed to allow Geography to hire an additional faculty member if Stan Morain would go back to half-time. After much discussion, an agreement was made which would allow this additional hire. The new faculty member would have brought the Department to 7.5 FTEs. That hire was scheduled for the 2000-01 academic year, but it never took place. Dean Fischer left his position and his replacement, Acting Dean Fritz Allen, had different ideas for Geography.

### **Crisis Again – Rebuilding**

Before the academic year began in 2000, the Department had volunteered to be in the first round of new graduate program reviews for the university. During the preceding spring and summer, the Department did a self-study (Department of Geography 2000) and in the fall brought in an outside review team. The review team was impressed with the progress that had been made and suggested the Department be allowed to bring the faculty up to 9 FTEs and then establish a Ph.D. program (Nellis et. al 2000). When the review process started, Michael Fischer was Dean, but the situation was very different when the review was completed. A new Provost had just been selected and an Acting Dean was in place in the College of Arts and Sciences. There was uncertainty whether the recommendations made by the review team would be followed. The Provost and Acting Dean concluded that resources were tight and nothing special was to be done for Geography.

This was the beginning of the second crisis. When it became evident there would not be any infusion of resources, Dr. Scuderi asked the Acting Dean to move his position to Earth and Planetary Sciences. The Acting Dean favored this idea and pressured Earth and Planetary Sciences to accept not only Dr. Scuderi but also Dr. Snell and Dr. Gregory, who had not asked to be moved. The Department was not informed of any of these potential changes until Earth and Planetary Sciences had agreed to accept the three geography faculty members. Even then the Department was not officially informed of the plot. The Acting Dean intended to dismantle the Department without going through any of the required University procedural requirements for programmatic changes. Although actions by Dr. Matthews and Dr. Cullen prevented this from happening, the progress of the previous years was undone. By the summer of 2001, Dr. Scuderi had been moved to Earth and Planetary Sciences, Dr. Gregory resigned, and Dr. Snell went on leave never to return. The Department lost its computer equipment and almost lost its lab space. The Department faculty shrunk to 4 FTEs.

The Acting Dean was replaced the following year by Dean Reed Dasenbrock, but the damage had been done. The faculty lines that once existed in Geography had been wiped out by the Acting Dean. To replace them the Department was given double their normal part-time budget. This was sufficient to teach 20 – 25 courses each year, which exceeded the number of courses taught by the regular faculty. The Department was also given some funds to

piece together a PC based computer lab. Thus began a rebuilding effort with severely diminished laboratory capability, but excellent part-time faculty.

New Mexico is blessed with many virtues and is a wonderful place for retired geographers. The Department survived by taking advantage of local retired talent such as Don McTaggart, John Campbell, Hal Jackson, Frank Pucci, and many others. This was not a new idea for the Department and had been a practice dating from the first shrinkage in the Department in the late 1980s and early 1990s. As a result of this infusion of talent, students did not see any major changes, and the Department continued to turn out the same number of graduate students and majors as before.



**Figure 5.** Department faculty and staff in 2006. (from left to right, Rick Watson, Jazmen Knight, Stanley Morain, Olen Paul Matthews, Elinore Barrett, Bradley Cullen; missing, Jerry Williams, Danielson Kisanga, Rodman Snead.

The graduate program has been particularly successful in weathering reductions in faculty members. Table 3 illustrates the number of M.A. students categorized by their last known employment who completed their degrees from 1991 to 2005. Many of the students during this period of time combined the use of environmental analysis and GI Science. Between 1991 and 2005, the Department produced 80 Master's students or 5.33 graduates per year. This is almost twice the rate of graduates as during the first 20 years of the graduate program. Table 4 shows a breakdown of the number of masters degrees granted in five year intervals for the entire history of the Department. Tables 2, 3, and 4 show some interesting trends in the evolution of geography at the University of New Mexico. With a concentration on GI Science and environmental analysis the value of a master's degree became more important as can be seen by the increasing number of graduates. There is also a shift in types of employment with the growth of GI Science in National Research Laboratories and in University Research Facilities. These two areas provided major sources of employment for graduates.

Table 3. M.A. and M.S. degrees and last known employment (1991- 2005)

<u>Category</u>	<u>Number</u>
Federal Agency	15
Consulting Firm	13
PhD Program	11
University Research Facility	9
National Research Lab (Sandia, Los Alamos)	9
College Faculty and Post Secondary Teaching	5
Local Government	5
State Agency	4
K – 12 Education	3
Other/Retired/Unknown	6

Table 4. Number of Master's Students Produced in Five Year Intervals

<u>Years</u>	<u>Number</u>
2001- 2005	26
1996 – 2000	31
1991 – 1995	23
1986 – 1990	19
1981 – 1985	14
1976 – 1980	8
1971 – 1975	16

At the end of his second term in 2002, Paul Matthews stepped down as Chair and was replaced by Stan Morain. For three frustrating years, Dr. Morain tried to get Dean Dasenbrock to increase the number of faculty members in the Department. His efforts were to no avail. The one exception was the creation of a Research Associate Professor position within the Department, which is filled by Richard Watson. Dr. Watson has expertise in archeology and remote sensing. This is a soft money position resulting from entrepreneurial efforts rather than the benevolence of the Dean. In 2005, Dean Dasenbrock became Acting Provost and the new Acting Dean, Vera Norwood, agreed to allow the Department to hire an lecturer starting in January 2006. This was the first positive news the Department had received since 2001. The crisis is not over, however. Stan Morain may be retiring from the Department in June 2006, but intends to remain as Director of EDAC. Paul Matthews will once again take over as Chair. The challenge ahead is to insure that upcoming retirements are filled with qualified new faculty.

### **The Future**

Geography at the University of New Mexico has weathered two major crises since its formation in 1961. Malevolent neglect on the part of several Deans has been the principle cause. In spite of these setbacks, the program is healthy. Part-time faculty who are very qualified have helped. A new instructor,

Danielson Kisanga, is being brought in to help with the GI Science curriculum and physical geography. Discussion is ongoing about the replacement of retiring faculty members. The rebuilding process has begun once more.

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