

# **Geography's Place in Higher Education in the United States**

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**ABSTRACT** Geography's institutional position in U.S. colleges and universities has strengthened over the past fifteen years. Student numbers have increased, many existing geography programs have expanded, and new programs have been launched. This article documents these developments and situates them historically. Attention is then directed to reasons behind the discipline's recent growth: heightened public interest in geographical issues, expanding awareness of geography in other disciplines, the geotechnology revolution, the growing job market for geographers, and improvement in geography education in some primary and secondary schools.

**KEYWORDS:** history of geography, geography education, social and institutional influences on geography, geotechnology, employment in geography.

## **Introduction**

By international standards the United States has a large and influential higher education geography community. U.S. colleges and universities play host to some 60 geography Ph.D. programs, 90-odd masters programs, and over 200 bachelors programs. The annual meeting of the Association of American Geographers (AAG) draws more professional geographers from around the world than any other meeting, and teachers and researchers from U.S. institutions of higher education play a significant role in shaping the international geography agenda. Viewed from a domestic perspective, however, geography's position in higher education looks less strong. The discipline is not as firmly entrenched in U.S. colleges and universities as subjects such as history, biology, and economics. Geography departments are generally smaller than those of neighboring disciplines, and there are many small colleges, and even some prominent universities, that do not have geography programs.

Recent gains in geography's position in U.S. institutions of higher education suggest that the discipline's domestic situation is improving. To what extent is geography's place in U.S.

colleges and universities strengthening—and what might explain its enhanced status? These are the central questions this article seeks to address. Confronting these questions is no easy task given the number and variety of institutions of higher education in the U.S. and the highly variable status of geography in those institutions. To make the task more manageable, the article focuses on traditional four-year colleges and on universities that offer graduate degrees. This means ignoring some parts of the U.S. higher education picture—notably two-year community colleges, which serve large numbers of students. Given the disproportionate influence of universities and traditional colleges in non-vocational arenas, however, concentrating on those institutions makes sense in a study focused on an academic discipline’s standing and future prospects.

With enrollment and departmental data showing notable gains for geography during a period when many U.S. colleges and universities have experienced fiscal challenges, a broad-ranging, catholic assessment of the discipline’s changing fortunes seems to be in order. With that goal in mind, this article begins with a brief overview of the twentieth-century trajectory of geography in U.S. colleges and universities. Attention then turns to the changing fortunes of geography programs during the past fifteen years. This is followed by a discussion of a range of forces that are arguably spurring geography’s enhanced standing in U.S. institutions of higher education. The conclusion sets forth some thoughts on the challenges that must be met if recent positive trends are to be sustained.

## **Background**

Geography emerged in the U.S. as a formal university discipline with its own departmental standing around the turn of the twentieth century when the modern disciplinary

matrix was being forged (see generally Martin, 2005, pp. 338-375). During the first half of the twentieth century, geography carved out an increasingly significant place in American colleges and universities. Brubacher and Willis (1968) point to a 1000 percent increase in the number of students taking college-level geography between 1900 and 1948, even as the total college population rose by only 100%. Yet this period also saw significant weaknesses in geography's institutionalization. Geography never found an independent foothold at some of the nation's leading research universities (Dunbar, 1996),<sup>1</sup> it was largely ignored at many smaller liberal-arts colleges, and it occupied a relatively marginal position in many of the colleges and universities where it was present. Moreover, as the first half of the twentieth century drew to a close, geography suffered a blow when one of the most influential universities in the country—Harvard—closed its department in 1948 (Smith, 1987).

The reasons behind geography's failure to carve out a more central position in U.S. colleges and universities during the first half of the twentieth century are complex, and have yet to be adequately explained or synthesized. It is beyond the scope of this study to attempt such a synthesis, but the relevant factors likely include (1) the early twentieth-century trend toward American isolationism, (2) the subsequent emergence of an internationalism premised on the idea that American-style capitalism provided a template for an emerging global political-economy that would render place differences increasingly irrelevant (Smith, 2003), (3) the growing prestige of the sciences and the concomitant privileging of those social sciences that treated differences from place to place as “noise” in their model-building efforts, (4) the growing institutional division between the physical and social sciences in American universities, making it difficult for a discipline that sat astride that divide to find a niche, (5) the marginalization of geography in the primary and secondary schools with the rise of a history-dominated social

studies curriculum (Schulten, 2001), and (6) the sense that geography had little to offer beyond the cataloging of Earth facts or problematic generalizations about environment-human relations. The latter factor suggests that geographers themselves were not beyond blame in the discipline's marginalization. The excesses of environmental determinism and the encyclopedic turn of the 1930s and 1940s surely played into Harvard President James Conant's devastating late-1940s assessment that geography is not a university discipline (Smith, 1987, p. 159).

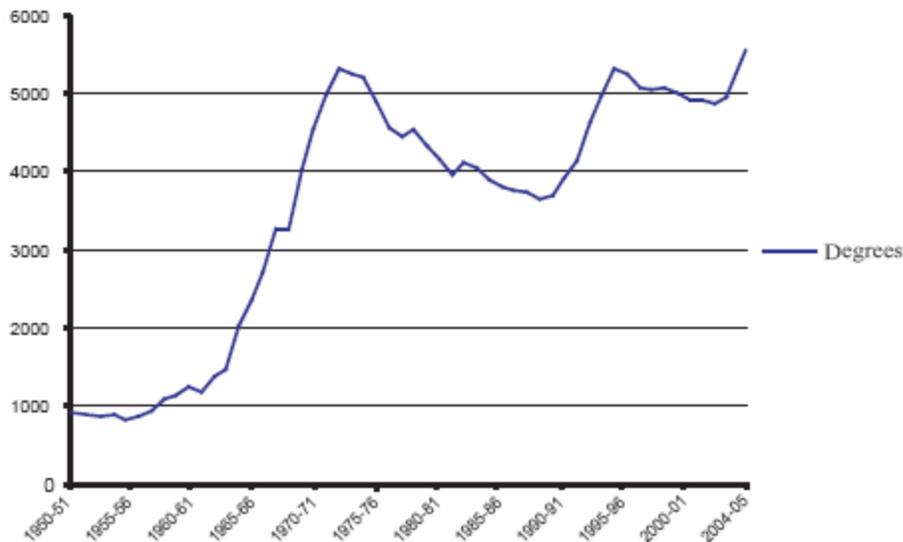
Of course geography was and is much more than Conant was willing to recognize. From the path-breaking ideas of Carl Sauer in the 1940s and early 1950s on the origins of agriculture to contemporary efforts to map and model the impacts of climate change, efforts to understand the causes and consequences of the spatial organization and material character of Earth's surface have proven to be of enormous intellectual and social value (NRC, 1997). That value helps explain the emergence of geography as a key university subject in many parts of the world, as well as the strong position the discipline occupies at a number of major U.S. universities. Moreover, some of American geography's most influential scholars in the second half of the twentieth century were drawn to the discipline in the early 1940s when it became clear that geographic understanding was essential to a country being drawn into a world war. Nonetheless, when examined in aggregate, it seems fair to conclude that geography occupied a somewhat fragile position in American higher education at the close of the first half of the twentieth century.

Even though there were weaknesses in the discipline's mid-century institutional standing, geography shared significantly in the baby-boom-driven expansion of U.S. higher education in the 1960s and early 1970s. New departments were founded and most existing departments expanded substantially. This was partly a response to the demand for programs that could train

primary and secondary school teachers. In addition, in some institutions geography departments were favored because they could provide general education courses at a relatively low cost—thus helping to support expensive specialized research programs in other parts of the university.

**Figure 1. Degrees Conferred, 1950-51 to 2003-04**

Source: AAG Handbook and Directory of Geographers, 2005



Data on increased student enrollment in geography programs demonstrate the significance of the program expansions of the period (see Figure 1). According to the U.S. Department of Education (DEd), between 1960 and 1970 total enrollment in geography programs in U.S. colleges and universities increased from 336,787 to 762,954 (Hill, 1989, p. 10). The upswing was arguably tied not just to larger trends in higher education but to the strengthening of geography itself. The quantitative turn began to pull geography away from a more descriptive orientation, and after a period of decline physical geography began to reemerge with stronger links to other physical sciences (Marcus, 1979). Moreover, growing curiosity about the larger world in the aftermath of World War II fostered interest in geography—although

the trend away from encouraging foreign fieldwork in many parts of the discipline ultimately worked against this source of potential students.

Despite geography's positive trajectory from the early 1960s through the early 1980s, the discipline lagged well behind sociology, political science, history, and economics in faculty size and student enrollment (Hill, 1989, p. 11). Moreover, most of the new post-war geography departments were founded at larger public colleges and universities. The shadow cast by Harvard's decision to close its department worked against the establishment of geography departments at smaller public institutions, private universities, and liberal-arts colleges, as the argument could (and was) made that a great university did not have to have geography (Cutter, 2004, p. 225-27). The situation was exacerbated when three other leading universities—the University of Pennsylvania, Stanford, and Yale—followed Harvard's lead and dropped their geography departments in 1963, 1964, and 1967, respectively. Hence, when the higher education juggernaut slowed in the mid-1970s, the academic discipline of geography was vulnerable.

Department of Education data on total enrollment in geography degree programs during the second half of the twentieth century (Figure 1) provide evidence of the discipline's weakened position in the two decades immediately after the 1960s boom (see also Pandit 2004; Hardwick, 2001). Geography was unable to sustain the growth it experienced after the early 1970s economic downturn in the U.S. economy. Financial pressure on public institutions of higher education in the U.S. led to a number of geography program closures. There were a few bright spots—most notably the founding of new programs in the U.S. West and South in response to the shifting geography of the U.S. population. Nonetheless, Fink (1979) documents a net loss of 32 U.S. geography departments from 1970 to 1976. The situation deteriorated further in the 1980s

when formerly prestigious departments were closed at the University of Michigan (1982), Columbia University (1986), Northwestern University (1986), and the University of Chicago (1987). As with the earlier closures at Harvard, Penn, and Yale, each of these program losses could be seen as the result of the actions of unsympathetic administrators or of internal problems (lack of attention to general undergraduate education, feuds among faculty, etc.). But focusing on such explanations directs attention away from the larger issue: many in the U.S. academic elite had come to view geography as a dispensable subject in institutions of higher learning.

From the perspective of 2006, the closing of the departments at Columbia, Northwestern, and Chicago appears to signal the end of an era of decline. Geography has not experienced a single major program loss since that time. In a few places geography has been folded into a larger unit with some loss of influence or standing, and a handful of mid-size programs have closed at regional colleges (e.g., West Georgia College). Nonetheless, the last fifteen years has generally seen a steady expansion of geography's institutional base. New programs have been founded, many existing programs have expanded, and student enrollment has generally risen (although not without a temporary downturn in undergraduate enrollments in the late 1990s—perhaps due to the rapid expansion of interdisciplinary environmental studies programs). As will become clear, these gains are potentially fragile, but there are also reasons to believe the discipline is on the threshold of further gains. Under the circumstances, the rather remarkable turnaround of recent years bears more detailed scrutiny.

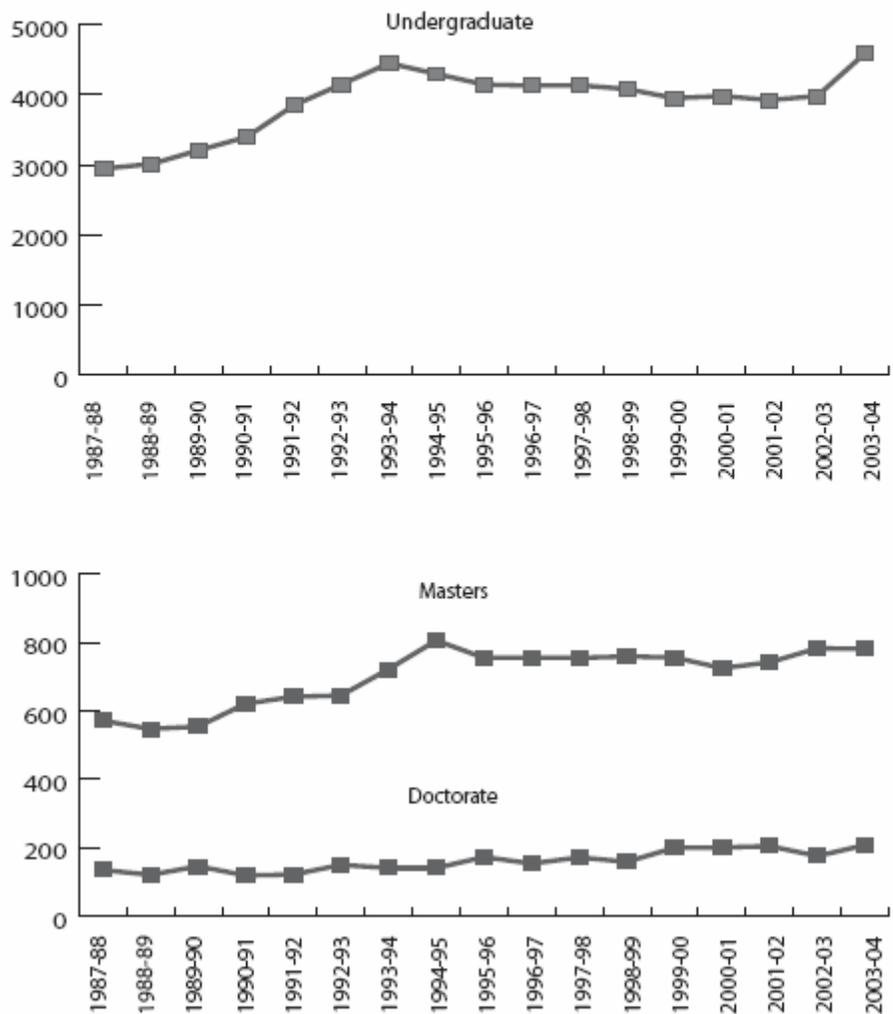
### **The Last Fifteen Years**

The previously discussed DEd figures provide a rather ambiguous picture of geography's forward progress over the past decade and a half. The lessons commentators draw from these

figures depend on the time period they examine. Gober *et al.* (1995) focus on the period from 1950 to the early-1990s—leading them to paint a picture of significant growth. Estaville et al. (2006), by contrast, focus on the period from 1993 – 2001 when the discipline seemed to be losing ground. Choosing the last fifteen years is no less arbitrary, but it is a useful temporal frame of reference as it corresponds with a time when the discipline moved out of the shadow of the program closures of the 1980s.

Figure 2. Degrees Conferred, 1990-91 to 2003-04

Source: AAG Handbook and Directory of Geographers, 2000 and 2005



The DEd data set forth in figure 2 show that from 1990 to 2004, there has been overall growth in student enrollment, but with some fluctuations in the undergraduate figures. An even more positive picture emerges when one looks beyond these data. A number of new geography degree programs have been founded in just the past ten years (Table 1), and the wave of new program creations has not come to an end. Among other developments, a new Center for Geographical Analysis has recently opened at Harvard, a new masters' program in geography is under consideration at Dartmouth, and new Ph.D. programs in geography or related fields are being contemplated at several other institutions.

**Table 1.** New Graduate Degree programs in Geography, 1990 – 2005

Program	Degree Offered	Date Launched
City U. of New York	Ph.D., Geography	2005
U. of Pennsylvania	MA, Urban Spatial Analysis	2005
Bridgewater State College	BA/BS, Geography	2005
U. South Florida	Ph.D., Geography	2005
South Dakota State U.	Ph.D., Geospatial Sciences/Geography	2004
U. North Carolina, Greensboro	Ph.D., Geography	2004
Montana State University	Ph.D., Earth Sciences/Geography	2003
Oklahoma State U.	Ph.D., Geography	2002
Florida International U.	BA, Geography	2001
Baylor	BA/BS, Geography	2000
West Virginia U.	Ph.D., Geography	1997
Georgia Southern U.	BA/BS, Geography	1997
U. of Connecticut	Ph.D., Geography	1996
Southwest Texas State U.	Ph.D., Geography	1996
Kansas State U.	Ph.D., Geography	1995
Florida State U.	Ph.D., Geography	1995

An indication of the magnitude of geography's enhanced institutional standing in recent years comes can be gained by comparing the U.S. geography department entries in the annual *AAG Guide to Geography Programs* for 1999-2000 and 2004-2005 (AAG 2000; 2005). The

entries in the guide list all tenure-line faculty, as well as the number of students enrolled for each degree offered by the institution. Figure 3 shows changes in faculty size and degrees conferred for all U.S. programs granting the Ph.D. in geography for which information was available, as well as a random selection of five geography masters-degree-granting and five geography bachelor-degree-granting institutions in each of six major regions of the United States.<sup>2</sup>

**Figure 3. Expansion of Geography Programs, 1999-2000 to 2004-2005.**

source: AAG Guide to Geography Programs, 1999-2000 and 2004-2005

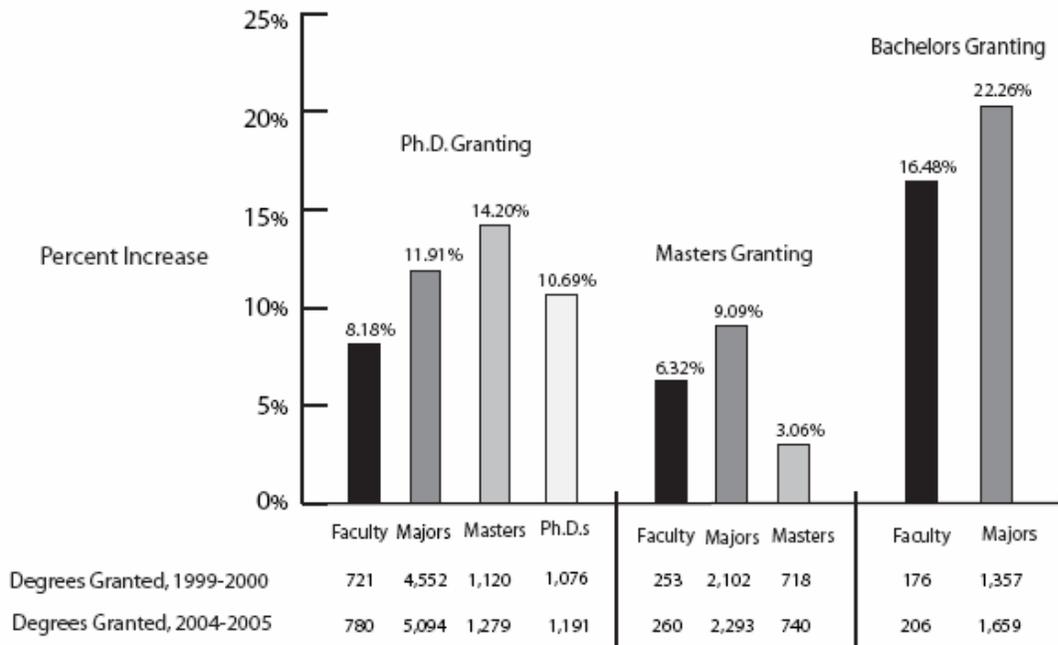


Figure 3 must be interpreted with caution, as the *AAG Guide to Geography Programs* is an imperfect data source. The figures in the guide come from an annual form circulated to departments by the AAG. Since the person responsible for compiling the data often changes over a five-year period, there is likely to be some inconsistency in reporting. Moreover, some inaccuracy is inevitable given the fluidity of student and faculty numbers and the changing

sources departmental staff use to calculate student numbers. Nonetheless, the general picture is unlikely to be wrong. At institutions where geography has a substantial presence, the size of geography departments and the number of students who are enrolling have expanded significantly over the past five years. Many programs have added faculty, and most have experienced growing student enrollment. Some of the expansion in faculty may not reflect increased institutional support for geography; growth could, for example, be the product of faculty success in garnering external grant monies that generate enough indirect costs to support additional faculty. But the overall picture is clear: geography's institutional position have markedly strengthened during the first five years of the twenty-first century.

There is much to suggest that geography's institutional standing will continue to strengthen. Geography's growth has occurred against the backdrop of a financial downturn at most U.S. colleges and universities; it seems unlikely that programs will soon undermine investments made during difficult times. Even more importantly, the number of new programs under consideration is rising. To cite but a few examples, the University of Nevada, Reno, is about to launch a new doctoral program in geography, and the University of North Carolina, Charlotte, is considering this step as well. A new multidisciplinary Ph.D. program in the Spatially Integrated Social Sciences is moving forward at the University of Toledo. Howard University has recently opened a Geographic Information Systems (GIS) facility on campus, and the university is working with the AAG to explore an expanded geography presence on campus. The University of Redlands is launching a university-wide initiative that will bring as many as eight faculty members to the university with a specialization in Geographic Information Science (GIScience).

It is an open question whether the institutions that are embracing only the technological end of the discipline (i.e., those focusing largely on establishing GIS/GIScience centers) will ultimately foster interest and investment in geography more generally. What happens in the wake of the founding of the new Center for Geographic Analysis at Harvard (see Richardson, 2005) may be instructive. The Center will be involved in teaching and research in spatial analysis and GIScience—developing its own courses and research initiatives, as well as coordinating activities across the university. This is a potentially significant development for an institution that once turned its back on geography, and it clearly signals a growing awareness that the discipline has something serious to offer. Its potential to fill an important gap in Harvard’s offerings and have ripple effects elsewhere, however, likely depends on whether it leads to a fuller range of geographic teaching and research at the university.

### **Explaining Geography’s Enhanced Standing**

Why is geography’s institutional position improving in the United States? In an effort to gain a better perspective on this question, I contacted leaders in a number of departments that have experienced particularly notable growth in faculty size or student numbers between 1999-2000 and 2004-2005. I asked them to explain the reasons behind their programs’ growth. Not surprisingly, many responses focused on specific strategies that successful programs often employ. These include paying attention to undergraduate education, developing effective mentoring and advising programs for students, working closely with administrators, creating effective web sites, collaborating with programs sharing similar goals and subject-matter

concerns, encouraging faculty to participate actively in the larger campus community, and aligning the department's mission with that of the larger university.

It is certainly possible that geography's recent growth can be attributed in part to expanding efforts to pursue such strategies. Indeed, the program closures of the 1980s arguably spurred many geographers to focus on institutional concerns and program-building initiatives. Moreover, curricular adjustments over the past fifteen years have made geography offerings more attractive to students.<sup>3</sup> Nonetheless, the breadth and diversity of geography programs that have experienced growth, and the founding of programs at institutions that did not previously have geography, suggest that geography's expanding position cannot be explained solely by programmatic adjustments. Wider forces are involved as well. These likely include: (1) a heightened general sense that geography is relevant to the issues of the day, (2) a greater awareness and appreciation of geography among scholars in other disciplines, (3) an explosion of interest in GIScience and GIS, (4) an expanding job market for individuals with geographic training, and (5) the emergence of a more analytically sophisticated geography in some primary and secondary schools. There is much overlap among and between these themes, but what follows are some comments on each.

#### *General Awareness of Geography's Relevance*

The first theme is perhaps the least well defined and the most difficult to substantiate, but there is much to suggest that geography has increasingly entered the public conscience. In recent years headlines have been dominated by widely publicized discussions of climate change, debates over new geopolitical maps, competing claims about the benefits and drawbacks of globalization, and reports of extraordinarily devastating natural disasters. Each of these matters

focuses attention on core geographical concerns: the human-environment interface, the nature and significance of differences from place to place, and the interlinked fortunes of places (see generally Hanson, 2004). Moreover, geographic representations and analysis (mapping, spatial analysis, etc.) are often a part of their public consideration.

There are, of course, many who have little idea that geography is relevant to the issues of the day, but the case can be overstated. As Alastair Bonnet (2003) persuasively argues, there is a well established popular sense that geography's role is to shed light on how the world is put together and how the differential character of places and environments affects people's lives. Against this backdrop, the widespread sense that we live in a rapidly shrinking world with intensified connections between distant places feeds the view that geography matters.

Americans have long been aware that developments in other places have an impact on the United States, of course, but there has arguably been a significant increase in the level of concern about global connectivity in an era dominated by news about terrorism, the outsourcing of jobs, growing gaps between rich and poor, and major natural disasters. At the same time, the personal computer revolution and the development of the Internet has brought the wider world into people's offices and homes in a way that was unimaginable just two decades ago. These developments have inevitably made many people feel that geography, or at least geographical understanding, is essential in the contemporary world. How else can one explain the fascination with (and outrage over) surveys highlighting the geographical ignorance of American students (see, e.g., National Geographic Society, 2002)? Such developments even help explain heightened official recognition of the discipline, as exemplified by the U.S. Congress' recognition of a national Geography Awareness Week in 1987.

Of course much of the popular concern over geography is based on the assumption that it is a subject to be addressed at the pre-college level—a clear reflection of people’s limited understanding of the discipline. But the surge in interest in geopolitics, globalization, and environmental change is surely fueling a more general interest in geography—including among college and university students. To cite but one example, at the University of Washington, geography professor Matthew Sparke has launched a course entitled “Introduction to Globalization.” Each time it is offered, the course attracts some 500 students who quickly come to see the value of geography for grappling with fundamental forces that are shaping the world around them.<sup>4</sup>

Fueling the growing level of public interest in geography is a gradual rise in the public visibility of geographers themselves. I have argued elsewhere that American geography has not done enough to reach out beyond the academy (Murphy, 2006), and the situation is not helped when geographers identify themselves to the outside world as something other than a geographer (ecologist, climatologist, urbanist, etc.). Nonetheless, the situation is improving. In the closing months of 2005 alone the U.S. media highlighted geographers by name and discipline for their contributions to understanding matters ranging from the devastation of New Orleans by Hurricane Katrina to the expeditions of Lewis and Clark, and from rural poverty in China to the renaming of streets in honor of Martin Luther King. During the same time period books by physiologist-turned-geographer Jared Diamond (1997; 2005) were occupying positions near the top of best seller lists. Moreover, anecdotal evidence suggests that geographers are increasingly being asked to speak at high-profile public events (de Blij, 2005a), and a small but growing number of geographers are publishing books with titles, if not always content, that reach well

beyond the confines of the discipline (see e.g., Agnew, 2005; de Blij, 2005b; Gregory, 2004; Smith 2003; Clark 2003; Wescoat & White 2003; Meinig 1986-2004).

Geographers have a long way to go before their public presence approaches that of political scientists, economists, historians, or biologists, but increasingly high profile contributions of by geographers—identified as such—undermine the sense that the discipline involves little more than place-name memorization. The institutional impacts of this perceptual shift are difficult to discern—particularly since academic administrators sometimes come from institutions that do not have geography programs. Nonetheless, growing general awareness of geography’s relevance has arguably served both to strengthen the discipline’s position at colleges and universities where it has long been present and to foster growing interest in geography at institutions of higher education where it has no formal presence.

### *Scholarly Awareness of Geography’s Potential*

The work of certain geographers has long had an impact outside the discipline. William Morris Davis was a major figure in the earth sciences in the early twentieth century and Carl Sauer had a significant influence on anthropology in the mid-twentieth century. Nonetheless, before the 1960s such examples were more the exception than the rule.

The situation began to change in the 1960s and 1970s—first when geography’s quantitative revolution brought the discipline closer to the intellectual currents shaping a number of neighboring disciplines and then when the work of geographers with a structuralist or humanist bent began to be more widely recognized. The writings of Richard Chorley, Arthur Strahler, and C. Warren Thornthwaite gave earth scientists an appreciation of the potential of a quantitatively grounded physical geography. The work of Peter Haggett, Torsten Hägerstrand,

and Brian Berry opened the eyes of social scientists to the potential of spatial analysis. By the mid-1970s David Harvey's Marxian analyses of urban geographic change made him a major figure in urban studies circles. And Yi-Fu Tuan's humanistic writings about space and place diffused throughout the humanities.

Geography's growing presence across the academy did not quickly translate into an enhanced institutional position in the United States. It took time for momentum to develop and for geographers such as those cited above to be seen as more than individual aberrations. The pace of extradisciplinary recognition began to accelerate in the mid-to-late 1980s, however, as geographical scholarship began to achieve greater prominence and scholars from other disciplines began to draw more explicitly on geography in their work. Sociologist Anthony Giddens (1985) looked to geography to ground his formulations of structuration theory, economist Paul Krugman (1991) chided his own discipline for ignoring the geographical dimensions of economic processes, and physical scientists at the Environmental Protection Agency began developing maps of ecoregions to facilitate analysis and planning (e.g., Omernik 1987). Additional fuel for geography's extradisciplinary impact came from the development of an increasingly high-profile feminist geography, which in part reflected the growing number of women joining the discipline. The work of Susan Hanson, Doreen Massey, Geraldine Pratt, and Linda McDowell, among others, helped shape the larger feminist project. Finally, the development of GIS played a role. More will be said about this in the next section, but the impacts of the pioneering work of geographers such as Michael Goodchild and David Mark became increasingly visible by the mid-to-late 1980s; the use of the term "geographic" in GIS highlighted the fundamentally geographical character of this new, powerful approach to understanding and representing the changing character of the earth's surface

As the 1980s gave way to the 1990s, larger intellectual currents helped to foster interest in geography among the practitioners of neighboring disciplines. Growing questions about the large-scale normative assumptions of everything from rational choice perspectives in political science to mechanistic process approaches in geology directed attention to differences from place to place: a core concern of geography. Moreover, geographers themselves began playing increasingly visible roles in the theoretical debates of the period (see, e.g., Pred, 1990; Sayer, 1992; Gregory, 1994; Massey, 1994). In addition, GIS gave scholars looking at a wide array of questions the ability to analyze and represent spatial differences in new and exciting ways. In a related vein, the turn toward postmodernism in the humanities and parts of the social sciences led to a wave of interest in the role of context in the production of ideas and meaning. Context was not always seen in geographical terms, but Michel Foucault's (1980, p. 67) call for an archeology of geographical knowledge stood as one example of a growing awareness among non-geographers that geography is a fundamental element of human perception and understanding. This, in turn, led to disciplinary concepts becoming almost trendy in certain parts of the academy—with words such as place, mapping, and even geography appearing with some frequency in the titles of scholarly works penned by non-geographers (see, e.g., Hossler & Litten, 1993; Anderson & Camiller, 1994; Perez, 1999).

Confirmation of geography's expanding extradisciplinary profile came in the form of a National Research Council (NRC) study in the mid-1990s, titled *Rediscovering Geography: New Relevance for a New Century*. In a forward to the report that came out of the study (NRC, 1997, p. vii), NRC Chairman Bruce Alberts wrote:

The discipline of geography has been undergoing a renaissance in the United States during the past decade. Geography's research focus on the study of human society and the environment through the perspectives of place, space, and scale is finding increased relevance in fields ranging from ecology to economics. At the

same time, many of its research tools and analytical methods have moved from the research laboratory into the mainstream of science and business.

Aimed primarily at an extradisciplinary audience, the report emphasized the science and technical/applied dimensions of the discipline, but the report made clear that geographers bring a particular, highly valued perspective to a wide array of issues that are part of the teaching and research missions of colleges and universities.

The report's significance stems in part from the independent *imprimatur* it gave to geography's long-standing claims of relevance. A less obvious feature of the report is its clear articulation of a set of core analytical perspectives that give geography some intellectual coherence. In the face of disciplinary fragmentation, the NRC had largely moved away from studies of single disciplines by the mid-1990s. An exception was made for geography because of its growing visibility and usefulness. The study director, Kevin Crowley—a geologist by training—commented at the time that because of the proliferation of different topical and theoretical approaches in many traditional subject areas, it was increasingly difficult to understand why practitioners of many topically focused disciplines were grouped together. Because geography is associated with a particular perspective rather than a topic or subject, however, he saw a useful common analytical frame of reference at the core of the discipline. This is a rather remarkable observation given long-standing concerns within geography about fragmentation, but the sense that the discipline can offer both an important and a coherent platform from which to view the world could well be another factor that has served to enhance geography's expanding extradisciplinary profile in recent years.

The last decade has, if anything, seen an acceleration of the trends outlined above. The evidence is necessarily somewhat anecdotal, but it is increasingly common for practitioners in other disciplines to look to geography as a potential source of ideas and insights. The role of

geographers is expanding at national and international academies of science (Turner, 2005). Geographers are playing an increasingly influential role in high-profile interdisciplinary groups focused on environmental change (e.g., TEMPO Members, 1996). Environmental scientists are working closely with geographers on assessments of natural hazards (e.g., Adger, Mathur & Dow, 2003). The 2006 meeting of the Association of American Law Schools included special sessions on geography and law. Humanities scholars at the University of Southern California are collaborating with geographers to develop programs on geography and the humanities. And these are just a few of the many examples that could be cited (see Marston, 2005).

One consequence of geography's growing visibility is that it is becoming less common than it once was to encounter faculty leaders and administrators in U.S. universities with no real sense of geography as a university discipline. Indeed, it is not uncommon to encounter a sense of excitement about geography and its potential. The case should not be overstated; geography is a mystery to many scholars working in the United States, and it remains virtually invisible in a substantial number of institutions of higher learning. But this is now much less common than it once was.

### *Exploding Interest in GIScience and GIS*

In many respects the mushrooming interest in GIS and GIScience is a special case of geography's growing extradisciplinary impact, but the magnitude of this development and its impact beyond the academy suggest the need for separate treatment. Just four decades ago the discipline's principal contributions in the mapping arena were in cartographic design, thematic mapping, and cartometrics. That all began to change with the development of GIS and related technologies—first in the 1960s, but with limited broader impact until the early 1980s (see

generally Coppock & Rhind, 1991). No single discipline can lay claim to GIS, but the tie to geography is strong. Geographers played a key role in the initial development of GIS, its purpose is to yield insights into a core geographical concern (the relationships among phenomena on the surface of the earth), and its end product is often a map (a type of representation closely associated with geography).

The development of GIS represented far more than an incremental modification of the way data is analyzed and displayed; it opened up entirely new avenues of inquiry, analysis, and representation. GIS offers a means of tying data digitally to a specific location so that its nature and impact could be assessed in relation to other data. Recognition of the analytical and applied value of the undertaking has precipitated what some have termed a revolution in the way contemporary society collects, stores, and disseminates information (see Dobson & Durfee, 1995). Its uses are wide and deep. From ecological restoration to congressional redistricting, from military strategizing to transportation planning, from emergency service deployment to the modeling of the impacts of climate change, GIS has become an indispensable tool for a wide array of practitioners and analysts in the public and private sectors.

Among those in colleges and universities who were part of the GIS revolution, attention initially centered on programming and display issues. As the technology became more sophisticated and its utility became more widely recognized, these matters were taken up more and more by the private sector and by individuals working for government agencies. By the mid-to-late 1980s those in institutions of higher education were increasingly turning their attention to the nature and impacts of different geographic concepts used in GIS, the cognitive underpinnings of GIS, and the impacts of GIS on society (Mark, 2003). In the process, they gave birth to a larger endeavor known as Geographic Information Science, which has emerged as a

focus of significant academic attention (see generally Mark et al. 1997). Many research universities devote significant attention and resources to this field—and its presence is growing at other colleges and universities as well.

The precise institutional situation of GIS and GIScience differs greatly from campus to campus. In most places GIS courses form part of the curriculum in more than one discipline—but which disciplines are involved varies. As for the more general field of GIScience, some institutions have large interdisciplinary initiatives in this arena; others simply have a smattering of professors focused on particular GIScience problems. In institutions with geography departments, it is quite common for that department to be the principal home of GIScience and the principal purveyor of GIS courses.

Any forward-looking institution of higher education can scarcely avoid serious engagement with GIS/GIScience. Not only are employment opportunities for students mushrooming in geotechnologies; GIS has become so ubiquitous that new arenas of research and practice are opening up with dizzying speed. The U.S. Geological Survey has launched a new GIS initiative that is having significant research and personnel impacts (US Geological Survey, 2005). The National Aeronautics and Space Administration and the National Imagery and Mapping Agency foresee a significant expansion in their use of geographic technologies in the coming years (Gewin, 2004). At the same time, organizations and researchers awash in geographic data are looking for ways to coordinate and manage geographic information systems (Richardson & Solis, 2004), and the expanding impacts of geographic technologies on society are crying out for investigation (see generally Harvey, Schuurman, & Pavlovskaya, 2005).

Reflecting and fueling the GIS/GIScience boom is a student population that is increasingly drawn to geographic technologies. Many of today's students have grown up in an

environment suffused with the products of these technologies. The typical weather report is accompanied by sophisticated map animations of changing weather conditions. Among the more popular dramas on television are “CSI” shows in which GIS and related forensic technologies are regularly used to solve crimes. Few young people pass up the opportunity to explore the possibilities of Google Earth (<http://earth.google.com/>) on their personal computers or are unaware of the thousands of GIS-based map images that accompany the news of the day. Even conventional newspapers and magazines offer a level of mapping that was unknown a few decades ago.

Under the circumstances, curricular offerings in the geographic technology arena tend to be popular among today’s students—something that certainly has not escaped the attention of administrators despite their relatively expensive costs. When considered alongside the scholarly and applied impetuses for devoting attention and resources to GIS/GIScience, the case for an expanded emphasis on the science and applications of geotechnologies in colleges and universities can be (and often has been) quite compelling. Because GIS and GIScience have an independent existence from geography in some places, such expansions do not necessarily work to the institutional advantage of geography. But the close link between geography and GIS/GIScience lends strength to the argument that the expansion of one should be accompanied by the expansion of the other (see Schuurmann, 2004, pp. 21-52, who convincingly argues that when the two are decoupled, both are weakened).

### *The Expanding Job Market for Geographers*

A further catalyst for geography’s enhanced institutional position in U.S. colleges and universities is the expanding job market for individuals with geographic training. This does not

mean that the term geographer is often found in job descriptions. But seen in utilitarian terms, geography has long had an employment advantage over some social sciences and humanities because there are clear practical applications for some of the basic skills that are a part of geographic training: map making, location analysis, terrain analysis, environmental assessment, etc. Moreover, contemporary geographical training also typically involves a set of critical thinking, writing, and presentation skills which, when combined with substantive knowledge of particular places or geographic phenomena, can be very appealing to employers. It is thus no surprise that geography majors find their way to positions ranging from foreign policy analyst to travel agent, from forest conservation monitor to weather broadcaster, from map maker to planner, and from elementary school teacher to surveyor.

Geography's heightened general profile in recent years has led to expanding opportunities for geographers in a variety of arenas, but the turn toward geographic technologies has been a particular catalyst for growth. The U.S. Department of Labor currently identifies geotechnologies as one of the three most important emerging and evolving employment arenas (along with biotechnology and nanotechnology) (Gewin, 2004).<sup>5</sup> Duane Marble (2006, p. 1) argues that we are "in the midst of a geospatial labor market shortage that shows every sign of growing more acute in the years to come." Simply put, a college or university seeking to prepare students for the job market of the twenty-first century cannot ignore the explosive growth in employment opportunities for those familiar with geospatial tools and applications.

Burgeoning employment possibilities have led many schools to develop courses and laboratories that teach students how to use and apply the latest GIS-related tools. But because the tools are evolving so rapidly, it is important to introduce students to more than software packages; they need to understand the nature of the tools they are using and the conceptual

foundations on which they are built. This has led many institutions to develop a curriculum emphasizing the conceptual underpinnings of GIS. Such initiatives can push the curriculum in the direction of geography, for that is the discipline that most clearly focuses on the acquisition, analysis, and display of spatial information or data. Any layer in a GIS involves decisions about data prioritization and spatial representation that are rooted in geographical principles and concepts. Without an understanding of these principles and concepts, the nature and import of the decisions being made can easily be ignored. Recognition of the importance of geographical understanding for GIS users has surely spurred the growth of a number of geography programs over the past fifteen years. Moreover, many job openings in the geotechnology arena are not simply for individuals with technical skills. They are in substantive areas (environmental analysis, transportation planning, marketing, planning, and weather forecasting) where geotechnologies are being heavily employed. Under the circumstances, students who have been exposed to substantive issues and problems along with geotechnologies are at an advantage.

Even outside the geotechnologies arena, larger social developments are making the understandings and skills of geographers ever more relevant to the world of paid work. The past fifteen years has seen significant growth in the fields of environment management and planning. At the same time, the globalization of business has led to increased opportunities for individuals with foreign area expertise, and the expansion of globally or regionally focused social, political, and economic programs has opened up a wide array of possibilities for those with substantial international experience and understanding. Geography's ties to all these arenas make it a potentially attractive focus for investment at a time when universities are under pressure to adapt to changing employment possibilities for their students.

### *Advances in Pre-College Geography Education*

The marginalization of geography in U.S. primary and secondary schools has long worked against a more robust presence for the discipline in the nation's colleges and universities. For several decades the vast majority of students went from kindergarten to high school with virtually no exposure to geography beyond a list of location facts to be memorized. This meant that students arriving at U.S. institutions of higher education were often not aware that geography was a university discipline, much less that it might address analytically interesting questions. Those who ended up majoring in geography often found the discipline by chance (i.e., a course that happened to fit an opening in a student's schedule), thus assuring that geography would remain a relatively small college/university major. And because few institutions of higher education require geography courses and many do not even have geography programs, a large number of students—including individuals who would go on to become academic leaders and administrators—complete their educations with no real sense of what geography has to offer.

By the late 1980s the level of basic geographic literacy in the United States began to attract national attention in the wake of surveys showing that most high school graduates lacked even a rudimentary understanding of how the world is organized (e.g., Gallup Organization, Inc., 1988). One of the most significant responses to this state of affairs came from the National Geographic Society, which funded a national "Geography Alliance" program in each of the 50 States, plus the District of Columbia. The program links teachers in elementary and secondary schools with college/university geographers in an effort to promote the teaching of geography in the schools, as well as to improve the quality of the geography that is taught (see Bockenbauer, 1993).

Geography Alliance programs were better organized in some States than in others, and with declining funding from the National Geographic Society in recent years, some of the less effective programs have tended to atrophy. Nonetheless, Geography Alliances have had a noticeable impact on geographic education in parts of the U.S. Many schools now pay more attention to the subject than they did two decades ago. In a few instances Geography Alliance members and sympathizers have been successful in promoting specific geography requirements, or at least ensuring that geography was included as part of a recommended curriculum (see generally Gober *et al.*, 1995). The University of Tennessee, the University of Colorado, and all the State universities in Minnesota require geography before admission (although there are opportunities for students who do not meet the requirement to take a geography course once they have enrolled). The State of Texas lists geography as part of its recommended high school curriculum.

In the early 1990s, geography education got another boost when a set of detailed, challenging standards for geographic education were promulgated and widely disseminated in the wake of the national education standards movement (Geography Education Standards Project, 1994). By explicitly challenging a simple place-name view of geography, these standards fostered appreciation for the nature and analytical potential of geography in places where they were disseminated. Nonetheless, such developments did not translate into a significant number of students entering U.S. colleges and universities as declared geography majors. (Most majors come from students who take a single geography course out of curiosity or convenience and become interested in the subject.)

In recent years, geography's addition to the College Board's Advanced Placement (AP) program has served as an increasingly significant catalyst for heightened awareness of geography

among students entering higher education. The College Board is a New York-based non-governmental organization that, in the 1950s, developed a program aimed at facilitating the transition from high school to college by supporting college-level “Advanced Placement” courses in high schools, and then sponsoring examinations that students use to receive advanced placement and/or credit when they enroll in participating colleges and universities (College Board, 1996). Over 12,000 schools in the U.S. and Canada participate in the program, as do more than 3,000 colleges and universities. AP courses are often thought to be among the most rigorous in the high school curriculum, and many students who take them go on to consider majoring in the subject of the course they have taken once they are in college (College Board, 1994).

Over the years, the College Board developed AP programs in over 30 subject areas, but geography was not on the list—a circumstance that compounded geography’s lack of visibility as a serious, high-level subject. The situation changed in the academic year 2000-2001, however, when the College Board’s first AP geography course was launched. That year over 3000 North American students took AP human geography, and as the following numbers attest, the trajectory has since moved rapidly upward (College Board, 2005):

2001: 3,272 tests  
2002: 5,285 (62% increase)  
2003: 7,329 (39% increase)  
2004: 10,471 (43% increase)  
2005: 14,139 (35% increase)  
2006: 21,088 (49% increase)

With preliminary estimates for 2007 already well exceeding the 2006 numbers, the impacts of this development are evident. A significantly expanding number of high school students are being introduced to geography at a much higher level than was previously the case. They are

much less likely to view the discipline in simplistic terms, and some of them will go on to pursue additional coursework in geography in college—and to major in the discipline.

Geography's expanding place in primary and secondary school education may be a particularly encouraging sign for the discipline in the years ahead. While colleges and universities are not strictly driven by enrollment numbers, student interest has an impact on curricular offerings over time. In geography's case, the impact may be most significant at some of the academically strong institutions of higher education that do not have geography programs. With students arriving on campus having been exposed to geography at a reasonably high level and expecting more, the lack of a geography program may increasingly be seen as a liability.

## **Conclusion**

The trends discussed in this article are encouraging to those who believe that geography has an essential role to play in higher education and society. It is important to remember, however, that geography starts from a comparatively marginal position. This suggests the need for some caution in drawing conclusions from this piece. Two points deserve particular emphasis. First, since geography's presence in U.S. institutions of higher education is comparatively small, positive trends can take on an appearance of significance that is greater than they deserve. It is encouraging, for example, that several new geography Ph.D. programs have sprung up in recent years, but these are mostly in institutions that long ago had doctoral programs in history, physics, and English literature. Hence, we must be careful how much significance we attribute to that development. Second, since geography's institutional position is somewhat fragile, it would not take much to reverse the current upward trajectory.

There is much that could be said about this latter matter, but three points bear at least some mention. First, the growth in demand for geographers at colleges and universities, as well as in private and governmental circles, could well be exacerbating a potential problem noted in the *Rediscovering Geography* report from 1997: the demand for geographers with advanced training may well be outstripping the supply ((NRC, 1997, p. 165). Unless a sufficient number of strong, well trained geographers are available to populate the new programs being formed, the success of those programs will be jeopardized. Fortunately, anecdotal evidence suggests that an ever stronger group of students is entering graduate programs in geography. Nonetheless, addressing the supply issue represents a clear challenge in the years ahead.

A second issue arises out of the complex relationship between geotechnologies and the discipline of geography. Even as geotechnology is, in many respects, at the leading edge of geography's forward movement in the U.S., some have expressed concern that it could either spin off as a subject unto itself or so dwarf geography's traditional conceptual foundations and approaches that the discipline will lose its status as one of the liberal arts and sciences (Johnston, 2000). While neither of these scenarios may be likely, there are certainly instances in which technically oriented programs have moved significantly away from general geography course offerings or have developed a techniques curriculum that is almost exclusively oriented toward vocational training. Such strategies may enjoy success for a time, but unless efforts are made to bring in broader geographical concepts and theories, geotechnology programs can become distanced from the intellectual currents shaping the sciences and social sciences. Conversely, there are instances in which GIS or GIScience is being pushed away by geographers uncomfortable with the technological turn or concerned about diverting attention from qualitative or social theoretic matters. Such actions risk alienating the GIS/GIScience

community from geography while undermining an important catalyst for geography's growth. The challenge is to build bridges between GIS/GIScience and other parts of geography. Since some of the most innovative work in geography is taking place at the intersection between these arenas (see Kwan, 2004), there is room for optimism on this point.

A final issue to note concerns the range of individuals being drawn into geography's orbit. A few decades ago U.S. geography was almost completely the province of men of northwest European ancestry. The status of women in the discipline has improved significantly in recent years. Women still have not achieved parity at the upper ends of the discipline (Hanson, 2004), but the situation has significantly improved. Now some 37 percent of undergraduates currently completing degrees in geography are women, and that figure rises to 44 percent at the Ph.D. level (DEd, 2006). The situation is much less encouraging for other segments of the population. Department of Education data for 2003-2004 show that a mere 2.53 percent of geography bachelor degrees go to what is termed non-Hispanic blacks, 4.79 percent to "Hispanics," and 3.55 percent to "Asian/Pacific Islander." The percentages are even smaller at the graduate levels. Given the growing racial and ethnic diversity of the United States, this is clearly not a sustainable situation if geography is to assume a place at the core of higher education in the United States. There are growing efforts to address this situation, but enhancing diversity within the discipline remains a clear and compelling challenge if geography is to build on the forward progress of recent years.

For all the potential pitfalls, the last word must necessarily be positive. Over the past decade and a half geography has moved from a position of substantial vulnerability to one of increasing centrality in the U.S. higher education landscape. It has expanded its presence at institutions with long-standing programs, and it is finding a foothold at a growing number of

institutions that long neglected the discipline. If current trends continue, there is hope not just that geography will grow in prominence, but that the students and faculties at American colleges and universities will be increasingly enriched by what the discipline can contribute to their institutions' intellectual life and pedagogic mission.

### **Acknowledgements**

The author would like to thank Demian Hommel for research assistance, and Demian Hommel, Jim Meacham, and Ivan Chung for assistance with data and figures. Special thanks to John Adams, Vicky Lawson, Marie Price, Richard Marston, and Sarah Bednarz of the AAG's Healthy Departments Committee for detailed comments on earlier drafts. I am also grateful for helpful input from Risa Palm, Susan Hardwick, Amy Lobben, three anonymous reviewers and the journal editors. The usual disclaimers apply.

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## Notes

- <sup>1</sup> One widely used indicator of the standing of major research universities in the United States is membership in the Association of American Universities (AAU)—an organization currently made up of 64 (?) leading research universities in the United States. As Dunbar (1986) shows, geography never had any independent standing at many of these, including Brandeis, Brown, the California Institute of Technology, Carnegie-Mellon, Duke, Iowa State, the Massachusetts Institute of Technology, Princeton, Purdue, Rice, Tulane, and Vanderbilt. A number of other such institutions established geography departments during the first half of the twentieth century, only to close them down later (e.g., Case Western Reserve, Catholic University of America, the University of Chicago, Columbia, Harvard, the University of Michigan, New York University, Northwestern, the University of Pennsylvania, the University of Pittsburgh, the University of Rochester, Stanford, the University of Virginia, Washington University St. Louis, and Yale).

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- <sup>2</sup> The six major regions were derived from the AAG regional divisions: the four largest AAG regions (the Pacific Coast region, the Great Plains-Rocky Mountain Region, the Southwest Region, and the Southeast Region) and two composites of smaller AAG regions (the East and West Lakes Division of the AAG and the Mid-Atlantic, Middle States, and New-England regions of the AAG). In a few regions there were fewer than five masters or bachelors institutions with listings in both guides. Under these circumstances, only institutions with complete entries for both time periods were considered.
- <sup>3</sup> Among the most significant developments spurring curricular innovation were the Commission on College Geography, an initiative of Susan Hanson when she was President of the AAG in 1991; a Virtual Geography Department project spearheaded by Ken Foote in the mi-1990s; and the Geography Faculty Development Alliance in the early 2000s—also spearheaded by Foote.
- <sup>4</sup> More information about the class is available from the course website:  
<http://faculty.washington.edu/sparke/global123.htm>.
- <sup>5</sup> At the behest of the AAA, the Department of Labor is currently revising the list of jobs associated with geographic training. The effort will likely result in the geography degree being designated as relevant to a much wider range of jobs than in the past.