THREE DECADES OF APPLIED GEOGRAPHY: THEMES FROM THE APPLIED GEOGRAPHY CONFERENCES SINCE 1978

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1. INTRODUCTION

The impetus for the first Applied Geography Conference in 1978 was a growing recognition of the significance of applied geography, a lack of forums dedicated to applied geographic problems at which ideas could be exchanged, and only limited outlets for publications (Frazier, 1978). At that time, those interested in pursuing applied geographic research and those practicing applied geography found themselves caught in a philosophical gap between applied geography and academic (basic) geography. The conferences and related publication have filled a void that was not being served by the professional geography organizations in North America and have since provided a venue for academic and non-academic geographers to explore diverse themes in applied geography as they are expressed in research and practice. Since 1978, the philosophical gap has narrowed (but not disappeared) (Frazier, 2004), and geographic concepts, themes, and tools are increasingly being applied by professionals both inside and outside academia (Warf *et al.*, 2004). Indeed, applied curricula can be found in a number of undergraduate and graduate geography programs (Boehm, 2004). In addition, there now appears to be greater interest in applied topics from geographers located outside North America.

Despite these advances, there seems to be a continuing need for a venue at which applied geographical issues can be addressed directly. To some extent, The Applied Geography Conferences appear to have fulfilled this niche; the conference has met every year for 30 years and annually publishes the related volume "*Papers of the Applied Geography Conferences*" (originally "*Papers and Proceedings of the Applied Geography Conferences"*). The underlying purpose of the conference has not changed, that is to provide "…for a regular forum wherein academics doing applied geographic research (or interested in applying research) and non-academic geographers can meet regularly to exchange ideas, information and expertise" (Frazier, 1978). This "exchange of ideas, information and expertise" has remained a critical component of the meetings. At the first conference, held at Binghamton University, there were no concurrent sessions and substantial time was allotted in each session for discussion to maximize interaction among participants. Since then, there have been as many as five concurrent sessions in order to accommodate the mounting interest in applied geography and in the conferences. However, interaction among participants remains a primary focus, and opportunities are always provided in the schedule for discussion, networking, and socializing. Periodically, there have been special themes that have run through the conference, with one or two day sets of consecutive sessions, including business geography and race and ethnicity, that have fostered discussion and networking.

Given this history, the publications of the Applied Geography Conferences provide a record of themes and trends in applied geography since the late 1970s. As Frazier (1978) pointed out, "Like the more formal philosophies, applied geography is an attempt to deal with relevant questions." Some questions that were relevant thirty years ago remain just as relevant today, other topics have declined in importance, while still others have come to the fore. Tools and techniques that are available to address geographic questions have also changed and facilitated our ability to understand and solve problems. This paper uses the existing 29 publications of the Applied Geography Conferences (1978 through 2006) to evaluate trends in applied geography, in terms of both what is being studied and who is studying it. While there are numerous other publications that focus on applied geography issues, such as the international journal *Applied Geography* which began in 1981, it is the publications of the conferences that provide a consistent record of the variety of themes, topics, and tools that represent applied geography in North America

2. DATA AND METHODS

In order to evaluate the evolution of applied geography, papers published in the annual publication of the Applied Geography Conferences were reviewed and a spreadsheet was developed for analysis. It is recognized that the published manuscripts constitute only a portion of the papers presented at each conference, but no consistent record of programs exists that would allow an analysis of all papers presented. As a result, we are assuming that the published papers are representative of all presentations. This may be a more reasonable assumption for some years than others, as the requirements for publication have changed over time. At the outset, the conference was an invitation-only meeting designed to develop discussion among those already involved in applied geography. As the range of participants increased over time and interest grew, the conference moved to a more open solicitation for abstracts, and consequently the range of topics increased as well. Furthermore, the requirements for publishing in the annual periodical have also evolved, gradually incorporating a more rigorous review process and utilizing external referees. In 2004, a double-blind review process was implemented which will almost certainly have had an effect on what is published. Nonetheless, the 962 papers published over the 29 years remain as the best source of data.

Several aspects of the papers were used to categorize them, including themes, authors, and authors' affiliations. The first and the third are presented here as they foster understanding of how applied geography has evolved and where some of this has taken place. Each paper was evaluated and categorized into a primary and a secondary theme, based on the reviewer's estimation of the topics that are central to the research. In some cases, there was one theme that dominated, but in most, there were at least two, and it was the reviewer's opinion as to which was listed first and second. As a result, the first two were counted and used for the analysis. All themes that were used in the categorization process are shown in Table 1. Again, this is not representative of the universe of applied geography, but rather it provides a convenient and rather consistent means of tracking what has been important to active applied geographers over the last three decades.

TABLE 1
THEMES USED FOR CATEGORIZATION

Applied Geography	Education	Political
Agriculture	Geomorphology	Pollution
Business Geography	GIS	Public Policy
Climate	Government	Race and Ethnicity
Census Geography	GPS	Recreation
Crime	Human Hazards	Remote Sensing
Culture	Impact Assessment	Retail
Data Management	Land Use	Rural
Development	Mapping	Tourism
Economic Geography	Medical Geography	Transportation
Energy	Migration	Urban
Environmental Analysis	Natural Hazards	Vulnerability
Environmental Management	Physical Geography	Water Resources
Environmental Policy	Planning	

There were a total of 962 papers published in the first 29 volumes, and these were included in this analysis. The number of papers published from year to year has averaged 33, but varied from a low of 11 in 1982, to a high of 61 in 2003 (Figure 1). Considerable variability exists in the number of papers published in the first half of the data record; the average number of papers per year from 1978-1992 is 29. These year to year swings in number of papers published are likely a function of meeting size, which in turn can be influenced by location of the meetings. Starting in the early 1990s, the number of published papers per year increased, and the average for the last 14 years of the data record is 37. Because of this variability and the large number of papers, the analysis that follows presents the findings over 10-year periods for 1978 through 1987 and 1988 through 1997. The last period covers the remaining nine years.

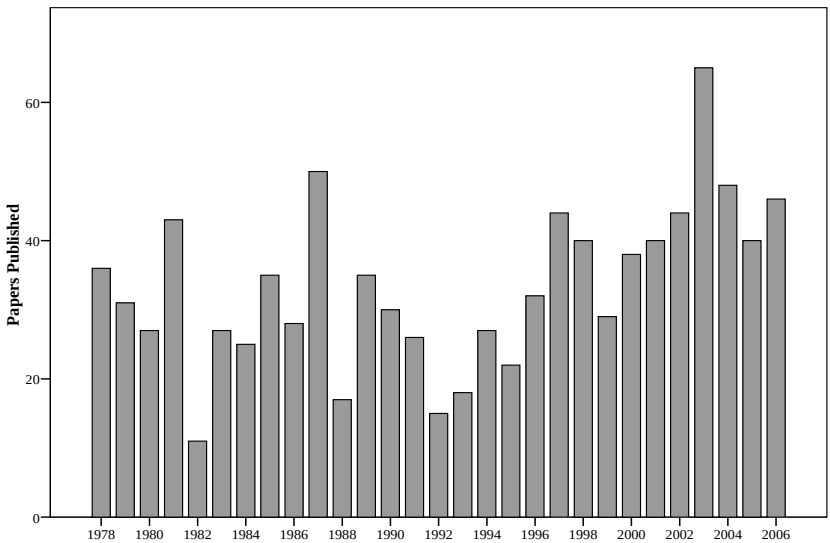

FIGURE 1
NUMBER OF PUBLICATIONS BY YEAR

3. THEMES

The results of categorization by theme for each time period are presented in Table 2. Only those themes that comprise more than five percent of the papers in at least one of the time periods are included. Percentages are used because there were more than 962 "counts" given the use of two themes for many but not all of the papers. In addition, several themes were merged, including business and retail, recreation and tourism, geomorphology and physical geography, and environmental analysis, management, and planning. While it is recognized that there may be distinct differences between many of these themes, there is often some degree of overlap, and such an approach facilitates the analysis.

TABLE 2
THEMES BY TIME PERIOD IN PERCENTAGES

Theme	**1978-1987**	**1988-1997**	**1998-2006**
Applied Geography	5	4	2
Agriculture	5	2	3
Business/Retail	11	15	9
Census	1	5	1
Climate	2	8	9
Development	9	7	6
Economic	4	6	7
Education	5	3	9
Env. Mgmt/Analysis/Planning	19	22	18
GIS	5	17	12
Medical	6	8	5
Natural Hazards	2	5	13
Planning	9	5	2
Recreation./Tourism	7	5	3
Remote Sensing	3	8	7
Transportation	10	4	6
Urban	5	2	6
Water Resources	12	13	10
Total	**N=312**	**N=265**	**N=385**

Environmental management, analysis, and planning dominated in each of the time periods, accounting for close to 20 percent of the papers in the first and last time periods, and greater than 20 percent in the middle one. Part of this may be due to the merging of three categories, but it also illustrates the importance of environmental planning and management to applied geography. Business/retail and water resources follow and are quite similar in the consistency with which they are found in each time period and in the fact that both experienced a slight decline in the latest time period. Clearly, though, these are themes that have been and remain central to applications of geographic concepts and tools.

At the other end, agriculture, applied geography, and census geography reached the five percent benchmark in only one of the three time periods. It is probably not surprising that applied geography was more dominant as a theme in the first time period, since the early goal of the conference was to promote discussion of applied geography and many wide-ranging ideas were raised. Since that time, however, the understanding of and appreciation for applied geography within the discipline has increased, so there is likely to be less use of that term as a specific theme. Nevertheless, all the papers still focus on applied geography, but only a few address it directly, probably because of the diversification of interests. It is argued that as the discipline has matured, so has the spectrum of interests. In contrast, other areas and themes have been

conflated. For instance, agriculture and census topics, while remaining important to applied geography (despite the numbers shown here), are frequently now embedded within other themes, such as the techniques used to address the problem. As remote sensing tools have developed and environmental and climate concerns have come to the fore, their application to agriculturally related questions has increased. Similarly, with census geography, the use of census data remains central to geographic analysis, but the study of census geography as a theme in and of itself is perhaps less important, separate from other demographic and socio-economic concerns.

Several themes did not make the five percent cut off, but merit some mention here. Papers addressing physical geography and geomorphology are found consistently throughout the three time periods (at approximately three percent). Once again, physical geographic issues may now comprise parts of more comprehensive studies without specific identification as physical or geomorphological. One major theme that has seen a significant upswing in interest among applied geographers is race and ethnicity, with only 0.7 percent of all published papers in the first time period, but reaching four percent in the last period. It is anticipated that this interest will only increase over time as geographers explore issues of vulnerability and marginalization throughout the discipline.

3.1 DECLINING REPRESENTATION OVER TIME

Several themes have experienced declines in their representation within the publication from the first time period, including agriculture, applied geography, development, planning, recreation/tourism, and transportation. The themes of agriculture and applied geography have already been discussed and so will not be considered again here. The other four, however, merit additional consideration. Development shows a small but consistent decline in representation. This is a very broad theme that was found in conjunction with business/retail, with urban areas, with facility siting, and with environmental planning, to name a few. The theme of recreation and tourism declined consistently by two percent for each time period. The relatively high percentage in the first period is partly explained by the coupling of recreation with other themes of particular interest to applied geographers, including geographic information systems (GIS), retail, the environment, and transportation. The diversity of these themes lessened after that period. Transportation shows a decline between the first and second periods, but an increase between the second and third. Part of the high initial percentage can be attributed to the contributions of Harold Mayer who accounted for some 40 percent of the transportation related papers between 1978 and 1987. The increase from four percent to six percent between the second and the last time periods cannot be explained by the contributions of just one person, but rather reflect a wide range of interests within transportation geography, including commuting patterns, highway and airline travel times, and transportation impacts, such as the geography of road kill.

Of the four, planning shows the greatest decline, from a high of nine percent in the first decade to a current low of two percent. Of course, many planners are trained in geography and many geography departments teach planning courses and have faculty and students who do research in the area. This decline could be a function of several factors working either separately or in combination. First, since the advent of the Applied Geography Conferences, the number of outlets for planning related publications has increased. Second, much planning related geographic research is project based, and thus culminates in reports to the funding body. And third, planning is a broad term, which fits under many of the other themes here. As studies became more specific to a type of planning, the categorization may have changed.

3.2 CONSISTENT REPRESENTATION OVER TIME

Several themes are characterized by rather consistent coverage over time, including education, medical geography, and urban topics. Each has hovered around five percent throughout the three time periods, though education has increased to nine percent in the last time period. It is not surprising that education was a topic of concern in the first time period, given the relative newness of applied geography as an accepted field within geography. As time progressed, concern with education dwindled somewhat but has seen a recent resurgence. However, only part of the resurgence is due to consideration of educating applied geographers and applied geography curricula. Certainly, these remain important concerns, but now the education papers are more likely to use geographic techniques to address spatial patterns of educational access, of school siting, and of educational success.

Like education, urban geography saw a decline between the first two periods, but has since increased in representation. Throughout all three time periods, urban topics tend to be more often a secondary rather than primary theme – that is, urban areas are the setting in which the research takes place rather than being the main focus of the paper. In the last period, as issues with urban and suburban sprawl, race, and ethnicity have become more salient to geographers, along with an increase in our abilities to apply geospatial tools to their analysis, the number of papers addressing urban geography has increased as well.

Medical geography has been a relatively consistent theme of interest to geographers, with much, but certainly not all, of the concern on access to health care and other medical services by various groups, both in the United States and elsewhere. As with urban geography, however, the application of geospatial technologies to the analysis of patterns and access may help to explain the high of eight percent that this theme reached in the second time period.

3.3 INCREASING REPRESENTATION OVER TIME

Five themes are characterized by higher representation in the subsequent two time periods as compared to the first. These include climate, economic geography, natural hazards, GIS, and remote sensing. Economic geography shows the smallest overall increase, starting at four percent and ending at seven percent. In the first time period, economic geography publications were primarily related to various other themes, including business, development, natural resources, and energy. In the later time periods, the diversity of related themes increased, but so did the importance of business and retail geography.

The themes of climate and natural hazards both show increases in representation over time, with climate increasing from two percent to eight percent of the published articles between the first and second time periods but only to nine percent in the next time period. On the other hand, natural hazards increased from two percent to five percent of the total between the first and second time periods, but leapt eight percent (to 13 percent) between the second and third. This increasing interest comes at a time when the salience of these issues has intensified worldwide, and it is gratifying to be able to show that the discipline of geography is taking on important social topics.

The increases seen in GIS and remote sensing reflect the growing importance of analytical tools to the discipline, and particularly to applied geography. As satellite technologies have improved and become more cost-effective, so too have our abilities to utilize remote sensing techniques and data for problem solving. The range of topics to which remote sensing has been applied throughout the years of the publication has expanded. In the first time period, half of the remote sensing articles addressed techniques, while the other half applied these techniques to such topics as transportation, agriculture, environmental analysis, and water resources. In the subsequent periods, there were fewer papers on remote sensing alone, and the range of topics to

which it was applied more than doubled, including GIS, urban geography, hazards, and land use.

The largest increase among all themes is that seen with GIS, moving from five percent of all papers in the first time period to seventeen percent in the second. While striking, it is hardly a surprising increase. GIS technology was in its infancy during much of the first time period analyzed here. Automated mapping, GBF/DIME, and the USGS land use and land cover analysis techniques were the subjects of early papers utilizing such systems. In the second time period, advances in GIS, such as development of the TIGER data structure by the Census Bureau, establishment of databases, integration and interfaces with remotely sensed data, and expansion of the range of topics to which the technique could be applied all help to account for the amount of published work. By the third time period, GIS tools are well embedded in geographic research, and are now beginning to include a broader array of approaches known as geographic information science (GISci). While the technology is probably used in a larger proportion of the papers than indicated by the 12 percent, it does not show up as a primary or secondary theme to the research.

3.4 SUMMARY

In addressing the trends in themes throughout the time periods, several factors must be considered. First, percentages are quite useful in illustrating trends because they control for the number of papers published in a given year, and thus fairly represent the temporal importance of the themes. However, such use creates a situation wherein a theme may have maintained a constant number of papers, but, in light of a growing number of papers published, the percentage would decline. Thus, it is the relative frequency of publication that is critical here and not the absolute. Second, while the analysis reflects geographers' interests in various topics over time, one cannot minimize the role that different institutions and individuals play in the trends shown here, as reflected, for example, by Harold Mayer's important contributions. The discussion of institutions that follows in the next section also helps to shed light on some of the reasons why particular themes, including climate and natural hazards, have had greater representation among published articles.

4. INSTITUTIONS

The work presented throughout the 29 years of the Applied Geography Conferences has emanated from government agencies, private sector businesses, and academic institutions. Indeed, this is one of the remarkable successes of the Conferences. Over 250 organizations and institutions have participated over the years, with non-academic institutions accounting for just over a quarter (27 percent) of all publications. Clearly, the publication record is heavily oriented to those from colleges and universities, for some rather obvious reasons including the need for academics to publish and the need for those outside academia to serve their clients first. Of the non-academic institutions, the Census Bureau and the Forest Service are most highly represented.

Applied geographic research has evolved in part because of the individuals and institutions that support it. The information in Table 3 presents those organizations that have contributed the most articles to the publication, again divided by time period. Those institutions that have contributed more than ten papers in at least one time period are represented in the table. The purpose of this is to illustrate both the range of institutions that have supported this research (and the conference) as well as the changes that have occurred over time.

Of the institutions listed, only one, the Bureau of the Census, is not a university. The universities shown here represent a wide range, from undergraduate-only programs to those offering the PhD degree, from those with large numbers of faculty members to those with fewer

than six, and from those that have geography departments to those in which geography is part of multi- or inter-disciplinary programs. Also notable is the fact that no single institution or set of institutions dominate throughout the 29 years. Rather, the interest in applied geography has been a shared vision. Only 19 institutions are represented here, yet, as mentioned above, more than 250 have contributed to the publication since its inception. On the other hand, it should be noted that these 19 institutions have provided almost 48 percent of the papers published.

TABLE 3
INSTITUTIONAL HOMES OF FIRST AUTHORS: NUMBERS OF PAPERS PUBLISHED

Institution	1978-1987	1988-1997	1998-2006	Total
Arizona State University	14	3	0	17
Auburn University	0	2	12	14
Binghamton University	14	5	12	31
Bowling Green State University	0	1	9	10
Bureau of the Census	7	7	1	15
Indiana State University	1	10	6	17
Kansas State University	3	18	31	52
Kent State University	12	23	10	45
Michigan State University	7	4	3	14
Oklahoma State University	3	3	6	12
Southern Illinois-Edwardsville	1	6	27	34
Texas A&M University	2	9	1	12
Texas State University-San Marcos	1	3	43	47
Texas Tech University	4	5	4	13
University of Michigan-Flint	0	4	6	10
University of New Mexico	2	8	13	23
University of North Texas	6	16	8	30
University of South Florida	0	1	28	29
University of Wisconsin-Milwaukee	16	3	1	20

One cannot ignore the important influence and contributions made by particular individuals at some of these institutions. The efforts of John Frazier at Binghamton University and the late Bart Epstein at Kent State University are evident throughout the years, as both universities have continued their strong commitments to applied geography. These two individuals were instrumental in encouraging many of their colleagues to participate actively in applied geographic research. Similarly, Andy Schoolmaster's leadership of the conference while at what is now the University of North Texas can be seen in the table. Both Indiana State and Kansas State Universities became prominent largely through the efforts of John Harrington, Jr., who moved from ISU to KSU in 1994. His influence can be seen in the changes in both institutions between the middle and last time periods. The University of New Mexico has shown increased participation over time, largely through the efforts of Brad Cullen. Finally, several institutions, including Southern Illinois University-Edwardsville, Texas State University-San Marcos, and the University of South Florida have shown large increases in participation in the last time period. In part, this can be explained by the efforts of specific individuals, but it also reflects departmental initiatives with contributions made by a number of faculty and students from these programs.

5. SUMMARY

Interest in applied geography and publication of geographic work that has application to addressing relevant questions have clearly increased over time, as indicated by the data presented here. There is a wide variety of themes with which applied geographers are

concerned, indicative of the vibrancy and diversity of the field. Yet, there is also consistency in what applied geographers address. Indeed, on one hand, applied geographers continue to confront issues that have been of concern for decades, such as environmental management, water resources, and business applications. On the other hand, applied geographers are also responsive to changing needs and topics, as reflected in the themes that have declined over time and those that have taken their places.

Of course, that a theme is less represented over time does not necessarily mean that it is not of interest to geographers. This analysis addresses only one outlet for the publication of such work, and as time has progressed since the first Applied Geography Conference in 1978, so has the number of outlets for publication of such work. Thus, this analysis does not provide a comprehensive review of all work in applied geography; instead it looks at only one outlet. Since 1978, there have been more interdisciplinary journals as well as more topic specific journals published that cover many of the themes analyzed here, including environmental management, geospatial technologies, and planning, to name a few.

This analysis leads to several conclusions about the evolution of applied geography, beyond that shown in the changes in themes. Publication by non-academics remains sparse, a factor that can in part be attributed to the factors mentioned earlier. Certainly, more of the articles that are being published even by academics present projects that have been implemented or that resulted from contract work. Thus, both research with the potential for application and work that has been applied are finding their way into publications. As Frazier (2004, p. 205) pointed out, "applied geography must bring new and innovative methods and information to the solution of society's most vexing problems." The evolution of themes in applied geography presented here illustrates that we have, indeed, been successful at doing this. What remains now, however, is to see how successful applied geographic research has been in effecting positive change for society.

6. ACKNOWLEDGMENTS

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