SURVEY OF CSISS PROGRAM APPLICANTS AND PARTICIPANTS 2000 - 2002

Survey Conducted in March 2003

Administered by the

University of California Santa Barbara

October 2003

Survey of Program Applicants and Participants (2000 – 2002)
Center for Spatially Integrated Social Science

In February 2003, the **UCSB Social Science Survey Center** conducted a survey of applicants to CSISS programs for years 2000 – 2002.

The **objectives of the survey** were to ascertain:

- the extent to which spatial analysis and spatial thinking have developed in the social sciences in recent years;
- the perceived needs of researchers in the social science community; and
- the success of CSISS programs in building infrastructure for the dissemination of spatial thinking in the social sciences.

The survey attempted to reach all individuals who applied to participate in CSISS workshops and specialist meetings (741) during the first three years of the Center's operations. These included 518 actual participants and 223 who were not admitted or who declined invitations to participate. Among participants, the level of involvement varies from those who attend a two-hour conference session organized by CSISS to those who participate actively in 2-day specialist meetings or weeklong workshops.

The UCSB Social Science Survey Center, directed by Dr. Paolo Gardinali, structured and administered an online survey of all CSISS applicants. The survey included objective and subjective questions. Of 594 respondents successfully contacted by email (i.e., did not bounce), 324 (232 participants, 92 non-participants) completed the survey, giving an overall response rate of 55% (51% for non participants and 56% for participants). The results of the survey are presented in two parts. Part I treats the objective questions and consists of tables of resultant data. Part II provides the actual unabridged subjective commentary to a set of five general questions, with responses for each organized the disciplines of respondents.

Background Information

The following tables (from CSISS workshop statistics) provide contextual information for interpreting the survey. Table 1 shows the disciplinary breakdown of actual applicants and participants for CSISS workshops (www.csiss.org/events/workshops) in the first four years of the program (2000 – 2003). While geography is the most strongly represented, its proportion of actual participants has declined from year to year. This reflects an increasing pool of qualified applicants from other social sciences – the primary target group for CSISS programs. The substantial increase in population and demography in 2003 reflects the offering of a specialized workshop in this area at Pennsylvania State University.

Table 1. Applicants and Attendees in CSISS Summer Workshops by Discipline

Discipline	Attendees					Applicants					Ratio Accepted
	2000	2001	2002	2003	**Totals**	2000	2001	2002	2003	**Totals**	
Economics	9	12	7	7	**35**	10	45	21	25	**113**	**0.31**
Political Science	14	5	4	9	**32**	26	12	7	13	**63**	**0.51**
Sociology	11	13	9	11	**44**	14	31	22	18	**98**	**0.45**
Anthropology	5	12	10	6	**33**	10	32	25	15	**94**	**0.35**
Geography	17	20	22	20	**79**	46	61	73	110	**310**	**0.25**
Public Policy	2	8	4	1	**15**	9	23	25	21	**86**	**0.17**
Urban Studies/Plan	3	6	3	8	**20**	6	11	10	48	**81**	**0.25**
Statistics	3	2	0	2	**7**	4	4	0	5	**15**	**0.47**
Criminology	3	6	3	1	**13**	4	10	7	6	**33**	**0.39**
Population/Health	1	12	6	24	**43**	2	18	22	61	**115**	**0.37**
Other, Social Science.	1	5	3	4	**13**	4	8	7	5	**29**	**0.45**
Other, not Social Science.	3	2	1	0	**6**	17	7	5	1	**32**	**0.19**
	72	103	72	93	**340**	152	262	224	328	**966**	**0.35**

In all years, interest in spatial analysis workshops among social scientists exceeded capacity by a significant margin. CSISS was able to serve 47% of applicants in 2000, 39 % in 2001, 32% in 2002, and 28% in 2003.

Table 2 identifies the changing academic status of participants and the gender breakdown from year to year. Whereas women represented about 45% of the applicants, they accounted for half of the actual workshop participants. CSISS has deliberately attempted to draw participants from among PhD students, post doctorates, and untenured faculty. Over the first four years of the program, these groups made up 76% of the workshop participants (260/340). However, interest among tenured faculty, and 'other' (mostly non-PhD graduates students and professional researchers in academic and government institutions) has been increasingly accommodated in the selection of participants. The selection process has also focused on achieving a strong interdisciplinary mix of participants. As a general but subjective observation, the quality of the applicant pool has been exceptionally high. The workshop instructors and CSISS staff involved in the selection process have regretted their inability to accept a much higher percentage of applicants.

Table 2. CSISS Workshops by Status and Gender (Attendees/Applicants)

Status	Number of Participants/Applicants					Ratio Accepted
	2000	**2001**	**2002**	**2003**	**Totals**	
PhD Cand. & Grad. Students	43/88	56/137	34/104	39/187	172/516	**.33**
Post Doc	5/16	8/15	5/20	8/20	26/71	**.37**
Untenured Faculty	10/18	20/46	15/35	17/39	62/138	**.45**
Tenured Faculty	9/13	9/21	2/11	14/35	34/80	**.43**
Other*	5/17	10/43	16/54	15/47	46/161	**.29**
Totals	**72/152**	**103/262**	**72/224**	**93/328**	**340/966**	**.35**
No. of Women	25/54	55/125	40/105	51/148	171/432	**.40**
% Women	34.7/35.5	53.4/47.7	55.6/46.9	54.8/45.1	50.0/44.7	

* non-PhD students and professional researchers, some academic, some government.

Participation in CSISS Specialist meetings (www.csiss.org/events/meetings) has reflected dominance in participation by professional academics (78% overall). These meetings generally target leading researchers in designated research areas in order to identify and address research needs in areas of growing scientific interest. As indicated in Table 3, male participation has exceeded female participation three to one, reflecting the gender mix among the current cohort of leading researchers.

Table 3. Participants in CSISS Specialist Meetings

	2000	2001	2002	2003	2004	Totals
Male	18	42	27	25		112
Female	8	12	2	16		38
Total	**26**	**54**	**29**	**41**		**150**
No. Univ Faculty	20	44	16	37		117
% Female	30.8	22.2	6.9	39.0		25.3
% Univ. Faculty	76.9	81.5	55.2	90.2		78.0

Summary Overview of Survey Results

Weeklong national workshops have constituted the primary CSISS vehicle for contact with the community of social scientists. However, in addition to workshop applicants and participants, the survey was also distributed to participants in CSISS Specialist Meetings (http://www.csiss.org/events/meetings/specialist.htm) and to attendees of special sessions and short workshops that CSISS has offered at academic conferences (http://www.csiss.org/events/conferences/). The survey results presented in this document do not draw distinctions among these different CSISS programs, but they do distinguish respondents who participated in CSISS programs from applicants who did not end up participating. As a general rule, this summary does not comment about discipline categories that have small numbers of survey participants (arts/architecture, communication/information sciences, computational sciences, environmental/agricultural studies, and psychology).

Part I of the survey contains detailed tabulations, organized in three sections:

A. respondent characteristics,
B. respondents' awareness of spatial perspectives in the social sciences, and
C. assessment of the CSISS experience by program participants.

PART I
Summary of Tables

A. Respondent Characteristics

With some exceptions, survey respondents mirrored closely the breakdown of applicants and participants by discipline, academic status, and gender.

Disciplines: Geographers were most prominent (27.5%), followed by political scientists (17%), sociologists (12%), anthropologists and archaeologists (11), and economists (10%). These core disciplines represented 77% of the 324 survey participants, with the remaining 23% coming mostly from interdisciplinary programs (e.g., population and health studies) or professional programs (e.g., planning and architecture), and the sciences (e.g., the computational and environmental sciences).

Academic Status: PhD candidates constituted 29% of respondents, followed by tenured faculty (22%) and untenured faculty (20%). The student and post-doc participation levels are lower than their representation in workshops over the first three years – 61% of attendees but only 45% of respondents. This difference reflects their greater mobility, the stronger likelihood of bounced emails, and the difficulty in tracking down their new locations. While faculty constituted 26% of workshop attendees through year 2002, they were the dominant participants in CSISS specialist meetings, so their 42% representation in the survey is consistent with their CSISS experience.

Gender: Women account for 40% of overall CSISS program participation, but as noted earlier; they are equally represented with men in the workshops, but significantly less represented in the specialist meetings. There are also differences among disciplines, with women highly represented among anthropologists and archaeologists (70%), but underrepresented in some of the larger discipline clusters (25% in economics, 30% in political science, 39% in sociology, and 40% in geography).

Discipline by Academic Status: This cross tabulation reveals three general patterns – disciplines with nearly equivalent representation among students and professors (geography, sociology), those with dominant faculty representation (economics and political science), and those with dominant student participation (anthropology/archaeology, population/health, and planning/public policy).

Participation in CSISS Programs: While 71% of survey respondents participated in CSISS programs, there was a tendency for those of firmer professional standing (post doctorates and faculty) to be more highly represented in the survey (81%) than those in student and other categories (62%). Among the more prominent participating disciplines, only political science (82% of respondents were participants) showed more than a 10% departure from the average.

Self Identification of Leadership in Spatial Analysis: 37% of respondents agreed or strongly agreed that they were leaders in research applications of spatial thinking and analysis within their disciplines. As expected, this varied with academic status – 64% for tenured academics and about 20% for the combination of graduate students, PhD candidates, and post docs. At the discipline level, planning/public policy (67%), computational science (58%), geography (49%), and political science (44%) respondents were most confident in their spatial analytic skills, whereas those from anthropology/archaeology (27%), sociology (35%), and economics (39%) were less inclined to see themselves among the leading spatial social scientists in their disciplines.

Use of Spatial Analysis in Research and Teaching: About 70% of respondents agreed or strongly agreed that they make extensive use of spatial analysis in their research and teaching. With the exception of post-doctorate researchers (56%), there is consistency across the different levels of academic status, ranging from 70% to 78%. For the core disciplines in the survey, this ranges from a high of 88% for geography to a low of 59% for political science.

Personal Expectation on the Future Importance of Spatial Perspectives: A striking 91% of respondents agreed or strongly agreed that spatial perspectives would play a more important role in their future research and/or teaching. This was consistently high across all categories of academic status (ranging from 82% for tenured faculty to 97% for the student and 'other' categories). Similarly high levels were recorded across disciplines.

B. Respondents' Awareness of Spatial Perspectives in Their Disciplines

Increasing Evidence of Spatial Thinking and Analysis: Survey respondents generally agreed or strongly agreed (88%) that spatial perspectives have played an increasing role in their disciplines over the past decade. This was also true across disciplines (from 83% in economics to 93% in planning/public policy and geography).

Adequacy of Funding for Spatial Research: Only 20% of survey respondents agreed that funding resources were sufficient, with a tendency for post doctorate and faculty categories to rate funding resources lower than this and for student respondents to rate funding more favorably. Greater variation in this assessment is shown by discipline. While 30% or more of geographers, sociologists, and computational scientists agreed or strongly agreed that funding was adequate, only 5% of political scientists and 12% of anthropologists/archaeologists agreed that this was the case in their disciplines.

C. Assessments of CSISS Experience

This section focuses primarily on the assessments of participants in CSISS programs.

Impact of CSISS Experience on Research: 85% of all participants in CSISS programs agreed or strongly agreed that their participation impacted positively on their research, an assessment that is repeated at similar levels (83 % to 91%) across all categories of academic status. For the disciplines most prominently represented among participants, the range was from 75% among anthropologists/archaeologists to 93% among sociologists. Notably, 14% (3 of 21) of economists and 17% (4 of 24) of anthropologists disagreed or strongly disagreed with this sentiment, a sentiment also expressed by participants from disciplines with low representation (4 in psychology and 1 in arts/architecture).

Impact of CSISS Experience on Teaching: Eliminating those for whom the question was not appropriate, 57% of 169 respondents agreed or strongly agreed that their CSISS experience impacted positively on their teaching, while nearly 32% expressed 'no opinion' on this statement. Selection of the neutral category was highest as a proportion of student and post doctorate participants who may be less likely to have control over what they teach. While, addressing the needs of teachers has not been a central focus of the CSISS program, it is understood that this was an important concern of some program participants. Geography participants were the most likely to agree or strongly agree on the positive impact of the program on their teaching (75%), but this varied to a low of 28% for anthropology/archaeology.

Changes in Intellectual Direction: A change in the intellectual directions of a person's research and teaching is seen as fairly high order of impact. Yet, 52% of program participants agreed or strongly agreed that this was the case based on their CSISS experience. For disciplines with ten or more respondents, this value ranged from 40% in the computational sciences to 57% in political science.

Use of CSISS Online Resources: Only 23% of CSISS program participants and 19% of non-participants agreed or strongly agreed that they made frequent use of CSISS online resources for teaching and research. Most respondents disagreed or strongly disagreed (53% of participants and 52% of non participants). While this may reflect the timing of the survey (e.g., CSISS web resources did not come online until late in the first year of the program), it may also reflect the need to promote the resources more forcefully. CSISS web resources have expanded steadily over the past four years.

Recommendations of CSISS Programs: Participants in CSISS programs were more likely than non-participants to recommend CSISS programs to students, colleagues, professors and advisors, advisees, and staff. Nonetheless, even non-participants recommended CSISS programs, especially to students (30%) and to colleagues (48%).

PART II
Summary of Responses to Open-Ended Questions

This section provides only short general interpretations of participant responses to each of five open-ended questions. Survey readers are invited to check the detailed unabridged responses, which are organized by question and by disciplines of respondents. CSISS welcomes comments and alternative interpretations and offers the option for readers to have their ideas posted to the site (see the comment box at csiss.org/survey/).

A3. Please list a few of the most important developments or initiatives that have influenced the growth of spatial perspectives in your discipline (list specific conferences, workshops, publications, funding programs, web resources, etc.) over the last decade.

There are distinct disciplinary viewpoints on this question. **Geographers** have a more intense and longer-standing familiarity with the technical developments in areas such as GIS, GPS, and spatial analysis. They cite specific institutions and programs (e.g., National Center for Geographic Information and Analysis (NCGIA), CSISS, Association of American Geographers, and NSF funding), conferences (recent GIScience and GIS Research UK), and software developments (open-source initiatives, SpaceStat, and ESRI products). In contrast to geography, respondents from other disciplines see spatial analytic interest as more recent and to some extent more fragile.

Political Scientists pay special attention to the role of individual scholars, especially the work of Gary King on issues of ecological inference, but also to work by Michael Ward. Their identity with institutions that promote spatial analysis is not as deep as for the geographers, but some note the role of CSISS and of the Interuniversity Consortium on Political and Social Research (ICPSR) courses by Luc Anselin. **Historians** call attention to the Electronic Cultural Atlas Initiative (ECAI) and to recent conference sessions sponsored by the Social Science History Association. In **Sociology**, respondents cite recent developments – the role of Anselin's ICPSR courses,

CSISS workshops, initiatives of the National Institute of Justice in promoting crime mapping, and the availability of software for inferential analysis of crime patterns. **Anthropoligists and Archaeologists** are focused more on GIS than on spatial statistics, and tend to see GIS more in a descriptive role. They cite the role of the Computer Applications in Archaeology Conferences as facilitating exposure to GIS and mapping technologies. However, there is an undercurrent of skepticism based on the clash between what is seen as a descriptive perspective and one based on more conceptual approaches. In **Economics**, researchers identify software for spatial econometric statistics (especially SpaceStat), exposure through the courses of ICPSR, and links with the traditions of spatial analysis in Regional Science as important. Among the remaining disciplinary categories, respondents make specific reference to the emergence of easier-to-use software, access to data, training opportunities made possible via private software firms (e.g., ESRI), NCGIA, CSISS, ICPSR, and URISA (Urban and Regional Information Systems Association), to funding programs of the National Institutes of Health (NIH), and to special sessions or meetings of scientific associations.

A4. What new developments or initiatives are forthcoming that could help or hinder the growth of spatial perspectives in your discipline over the next decade?

On this question, researchers from different disciplines appear to share common interests. Foremost are concerns for data (availability with georeferencing, accessibility in both aggregate and disaggregate (individuals) forms) and the need for wider availability of inexpensive and easy-to-use software for GIS, mapping, and spatial statistics. Significant mention is made of the need for time-series data, along with the enhancement of existing software to accommodate more easily the temporal dimension in analysis and modeling. Respondents from several disciplines note the potentials for agent-based modeling and other simulation methodologies (notably geography, anthropology, economics, and environmental sciences). Health and population researchers and political scientists express needs for developments in Bayesian statistical modeling and planners focus on needs to enhance public participation GIS (PPGIS). In addition, there is wide recognition of the need to mesh emerging spatial technologies with the opportunities provided by the Internet for online access to tools and data and for collaboration across disciplinary and other boundaries. An integrated platform for GIS, visualization, simulation, and spatial analysis is high on the wish list of spatial social scientists, and some mention the desirability to link these for wireless mobile access and use. The expense barriers for software, satellite imagery, and special data sets are seen as the primary impediments to the more rapid integration of spatial methodologies into social science research. But others also note concerns for confidentiality of personal data at the individual level, both as a threat to personal security and as an impediment to the beneficial science that might arise from the use of such data.

Training programs (such as those provided through CSISS and ICPSR) are also seen as important.

A5. Please identify (list) any programmatic or resource needs for spatial social science research and teaching in the near future that are not likely to be met adequately by CSISS or by other institutions.

Responses to this questions complement those of the previous question. The general perceived situation is that both existing special programs (such as CSISS) and the primary institutions for diffusion of these methodologies (especially universities) do not have sufficient resources to satisfy demands or to provide the depth of training required. While the more technically oriented respondents focus on needs for core curricula and programming protocols for GIS and spatial statistics, most social science respondents see critical needs to embed spatial thinking within instructional programs of the different disciplines. They cite needs for good

examples of course syllabi for spatial analysis in their disciplines, coupled with data sets and exercises for training students and researchers. Insufficient opportunities to study GIS and spatial analysis are seen as common concerns that are compounded by software and training programs that are beyond the budgets of educational programs in the social sciences, especially in smaller and less-research-oriented institutions. Several respondents from different disciplines noted the desire to link spatial analysis with qualitative research methods and to have easy access to examples of how existing non-spatial research methods can be linked within spatial analytic frameworks.

A6. Please identify (list) what you consider to be the most significant programmatic or resource needs for spatial social science research and teaching for the next decade.

The basic themes, repeated almost universally by respondents from across the social sciences, include:

- **Accessibility** – to data at a variety of scales, cheaply and easily, making use of Web technologies when possible.
- **Software** – inexpensive, easy-to-use, and integrating a variety of spatial and statistical tools for analysis and modeling. Software should facilitate research across dimensions of time and space, at multiple scales, and with multiple theoretical approaches.
- **Training** – the need for workshops and courses oriented to the needs of specific research communities, and the inclusion of spatial analysis among standard social science methodologies.
- **Course Resources** – syllabi, student-friendly exercises and related data sets, and comprehensive textbooks with examples of relevant applications are high on the priority lists of several respondents.

A7. Please share specific examples or anecdotes of how your experience in spatial analysis has impacted your research or teaching and of how spatial perspectives have influenced developments in your discipline.

The full listing of anecdotes is worth reading, offering examples of how spatial analysis is learned, used, and is perceived to make a difference in teaching, research, and application. A few statements from selected respondents (without attribution) from different disciplines are repeated here as illustrations of both shared and case-specific insights and experiences.

Antrhopology and Archaeology:

* In my discipline, there has been a huge reaction against the use of computers and statistics in archaeology. There are also many who do not believe in the usefulness of GIS is archaeology - it is merely for pretty maps they say. However, for my current research on the settlement patterns of Roman Britain it has been an invaluable tool for analyzing the distribution of settlements and artifacts, visualizing the landscape and providing contextual information for settlements (placing them within the environment). It has also been valuable for predictive modeling. In the age of post-processual archaeology, I say GIS is an incredibly valuable tool for archaeology, as long as one is aware of the limitations of archaeological data and various analysis techniques.
* Spatial studies using GIS are relatively new and fairly contested in my discipline. However, through your training as well as other university training, I feel that it is indispensable for my proposed dissertation research. GIS has the potential to aid spatial/temporal research, particularly in the hypothesis building and testing stages of analysis.
* I have used cluster analysis to look at the clustering of sites within river valleys in Mesoamerica. I have used the information from the summer course to teach students the basics of spatial patterning analysis in my courses in archaeology and sustainable international development.

* My knowledge and ability to work in ArcView GIS has greatly improved since attendance at the workshop. This skill will be directly made use of in my PhD research, as well as my future academic career.

Computational Sciences:

* For us, it is the visual effect of showing conclusions on a map that is most important. We have experienced this several times with potential customers, who initially were not much impressed without the visual clue.

Communication and Information Sciences:

* I have not been able to fully infuse spatial analysis into my research. I am just beginning in my field in terms of research, and plan to definitely incorporate this soon. What has impacted me is the whole new way of thinking about and perceiving the world and its' data.

Economics:

* Spatial estimation issues are beginning to have an impact in my discipline, but these are still considered peripheral to the point that it is difficult to justify teaching a course focusing on these issues in anything but a PhD program.
* I have made use of ArcView for the first time in a research project to estimate a contagion model based on physical proximity.
* The techniques that I have learned in these workshops has resulted in three research papers currently under review with three research journals in marketing and real estate.

Environmental and Agricultural Sciences:

* My advisor thought I was nuts to go off to a spatial analysis workshop last summer, however now we are beginning to write grants that will require collection of GIS data and spatial analysis to inform more specific research questions for my dissertation. She's been converted!

Geography:

* I have been using the techniques I learned from the workshop to analyze two sets of data. I teach these techniques in one of the graduate classes I teach. The students really like to learn them and all of them have applied the techniques in their theses or dissertations.
* The growing recognition of the importance of space by colleagues in economics, religious studies, and anthropology has led to collaborative projects.
* Specifically, my experiences at the CSISS summer workshop at OSU has helped further my thinking in terms of how to incorporate issues of accessibility into my dissertation work.

History:

* Spatial analysis has allowed me to stress, in both research and teaching, the ways that connections between locations have affected historical processes within them, and it has permitted me to treat the complexity of these processes within a much richer multivariate and multidimensional approach than was possible earlier. I am referring here specifically to the use of Geographic Information Systems to combine layers of distinct data types for a visualization of these processes.

Planning and Public Policy:

* It has been of some importance for me to be knowledgeable about spatial analysis but neither the Dean nor many others in my dept. know what to do with the skills/methods. I am not given the flexibility or time to produce meaningful results (i.e., have not yet been given the opportunity to teach a full course in GIS/spatial analysis – the upfront cost is too great).
* Cluster and pattern analysis has allowed my organization to think out of the box when it comes to urban typologies/classification. With the use of advanced remote sensing techniques and spatial analysis/statistics, we hope to go beyond the typical land-cover/land-use classification and incorporate socio-economic factors in characterizing and comparing urban regions.
* Spatial analysis has allowed me to uncover important, but often overlooked spatial variation in social welfare programs, outcomes, and resources. In the past policy, analysts have sought large nationally representative surveys, yet today we see more policy research taking spatial variation into account as it draws samples and conducts analyses.

* Using GIS for spatial analysis in my research projects helped me looking at data geographically and often it suggested new insights and explanations that these connections are vital to understand and manage social and spatial problems.

Political Science:

* I have constructively raised eyebrows in a number of settings just by pointing out that spatial autocorrelation could be a problem in various models, and by describing the relatively simple spatial lag approach. Whether this awareness is growing significantly in political science is something I will have to look for in coming months.
* Countries are not independent units, and we should take into account the fact that (neighboring) countries influence each other. [For] diffusion of conflict, democracy, and economic development, spatial analysis is useful to detect the patterns.
* I am teaching a course right now that would not have occurred without my participation in the CSISS workshops. Teaching a course in the use of GIS is pretty straightforward; teaching a course in spatial analysis is far more challenging, but the intellectual rewards are far greater.

Population and Health:

* The notion that causative exposures occur at specific space/time coordinates until very recently has been lacking among epidemiologists and health scientists who tend to have a clinical tradition. As applications of GIScience in health analysis have expanded, institutions are 'finally' adding spatial training to their public health curricula. But this is slow going, and the training materials and resources from CSISS serve a critical need.

Psychology:

* Within developmental psychology (my discipline), the focus on spatial analysis is rare, but the growing numbers of people involved in activity or cultural historical theory are increasingly attending to the material environment. My program works in close quarters to an environmental psychology program, thus there is increasing crossover, but it is still quite limited and isolated from other areas of social science involved in spatial perspectives.

Sociology:

* I have included an alternative method (for sociologists) for aggregating social and economic information into my dissertation, which is currently receiving a fair amount of attention. I have been invited to give a talk on this alternative method at a national conference in Aug. CSSIS has been fundamental in developing this interest/perspective.
* I am currently incorporating spatial analysis techniques in my undergraduate courses to expose students to the importance of paying attention to spatial qualities in urban inequality.
* I have personally benefited immensely from exploring spatial analysis and have carved out a nice niche for myself within my discipline. I am continually amazed at how interest in spatial analysis continues to grow.
* I use GIS and spatial thinking to create precise pollution proximity indicators and facilitate spatial autoregressive procedures, and I use maps to test spatial hypotheses and better understand the spatial relationships between social groups and social goods and ills.
* The visualization methods grounded in cartographic conventions that I studied in last year's workshop have greatly improved the quality of maps I produce for law enforcement officials. I'm able to produce more data-rich maps that can be quickly reproduced and disseminated throughout an agency and in different formats.
* I have been able to link demographic change and social struggle but because of the lack of access to software and assistance, I simply am forced to use stickers and photocopied maps. A bit frustrating!

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Note to Survey Readers: Donald Janelle prepared this summary from documentation derived from the survey conducted by the UCSB Social Science Survey Center. Since data of these kinds are subject to variable interpretations, readers who wish are invited to comment and to offer their own interpretations about the tabular exhibits and responses to questions that follow in the appendix of survey data. You may use the comment box on the CSISS survey web page for that purpose (see csiss.org/survey).

Part I tables

A. Respondent Characteristics

Discipline Representation in Survey of CSISS Program Applicants and Participants for Years 2000 - 2002			
Discipline	Frequency	Percent of 313	Cumulative Percent
Geography	86	27.5	27.5
Political Science, History, and Law	52	16.6	44.1
Sociology	37	11.8	55.9
Anthropology and Archaeology	35	11.2	67.1
Economics	30	9.6	76.7
Population and Health	17	5.4	82.1
Planning and Public Policy	14	4.5	86.6
Computational Sciences (Statistics, Computer Science, Spatial Analysis)	13	4.2	90.7
Communication and Information Sciences	12	3.8	94.6
Environmental and Agricultural Studies	8	2.6	97.1
Psychology	7	2.2	99.4
Arts and Architecture	2	0.6	100
Total	313	100	
Missing Discipline	11		
Total	324		

Planning and Public Policy includes: Urban Planning, Regional Planning, Physical Planning, Social Service Systems Reform, Institutional Evaluation, Public Administration, Disaster Mitigation, and Transportation Planning.
Population and Health includes: Population, Demography, Epidemiology, Public Health, and Pharmacy Administration.
Communication and Information Sciences includes: Communication, Library, and Information Science, Linguistics, Education, GeoInformatics Management, Information Science, and Machine Learning.

I am currently a:			
Academic Status	Frequency	Percent of 317	Cumulative Percent
Graduate Student	33	10.4	10.4
PhD Candidate	91	28.7	39.1
Post Doctorate	19	6.0	45.1
Untenured Academic	62	19.6	64.7
Tenured Academic	70	22.1	86.8
Other	42	13.2	100.0
Total	317	100.0	

Gender			
Discipline	**Male**	**Female**	**% Female**
Geography	49	33	**40.2**
Anthropology and Archaeology	10	23	**69.7**
Environmental and Agricultural Studies	5	2	**28.6**
Economics	21	7	**25.0**
Political Science, History, and Law	31	13	**29.5**
Psychology	2	5	**71.4**
Sociology	22	14	**38.9**
Computational Sciences	11	2	**15.4**
Communication and Information Sciences	10	2	**16.7**
Arts and Architecture	0	2	**100.0**
Planning and Public Policy	8	6	**42.9**
Population and Health	6	8	**57.1**

I am currently a:						
Discipline	**Graduate Student**	**PhD Candidate**	**Post Doctorate**	**Untenured Academic**	**Tenured Academic**	**Other**
Geography	8	20	1	18	22	12
Anthropology and Archaeology	4	14	4	5	4	2
Environmental and Agricultural Studies	3	2	1	0	0	2
Economics	3	6	2	6	9	3
Political Science, History, and Law	1	8	3	12	16	4
Psychology	1	4	0	1	0	1
Sociology	4	12	2	9	6	3
Computational Sciences	2	1	1	1	5	2
Communication and Information Sciences	1	4	1	1	1	4
Arts and Architecture	0	0	0	0	1	1
Planning and Public Policy	1	8	1	1	2	1
Population and Health	3	6	1	0	1	3

Respondents who participated in at least one CSISS workshop/meeting							
Current Status	**All Respondents**	**Graduate Student**	**PhD Candidate**	**Post Doctorate**	**Untenured Academic**	**Tenured Academic**	**Other**
Total	316	31	86	18	57	67	40
Yes, I have Participated	225	16	58	17	43	55	24
No I have Not Participated	91	15	28	1	14	12	16
% Yes, I have Participated	**71.2**	**51.6**	**67.4**	**94.4**	**75.4**	**82.1**	**60.0**

Respondents who participated in at least one CSISS workshop/meeting			
Discipline	**CSISS Participants**	**Non Participants**	**% of Respondents who Participated in CSISS**
Geography	60	21	**74.0**
Anthropology and Archaeology	24	10	**70.6**
Environmental and Agricultural Studies	5	3	**62.5**
Economics	21	8	**72.4**
Political Science, History, and Law	37	8	**82.2**
Psychology	4	3	**57.1**
Sociology	27	9	**75.0**
Computational Sciences	11	2	**84.6**
Communication and Information Sciences	9	3	**75.0**
Arts and Architecture	1	1	**50.0**
Planning and Public Policy	7	7	**50.0**
Population and Health	7	7	**50.0**

I am a leader in research applications of spatial thinking and analysis			
	Frequency	Percent of 318	Cumulative Percent
Strongly Agree	**36**	**11.3**	**11.3**
Agree	**83**	**26.1**	**37.4**
No Opinion	57	17.9	55.3
Disagree	75	23.6	78.9
Strongly Disagree	39	12.3	91.2
NA	28	8.8	100.0
Total	318	100.0	

I am a leader in research applications of spatial thinking and analysis							
Current Status	**All Respondents**	**Graduate Student**	**PhD Cand.**	**Post Doctorate**	**Untenured Academic**	**Tenured Academic**	**Other**
Total	281	25	72	18	55	64	32
Strongly agree or Agree	116	5	17	3	25	41	20
No Opinion	57	7	20	6	9	9	3
Disagree or Strongly Disagree	108	13	35	9	21	14	9
% Strongly agree or Agree	**41.3**	**20.0**	**23.6**	**16.7**	**45.5**	**64.1**	**62.5**
There were 28 respondents who answered the question as Not Applicable to them.							

I am a leader in research applications of spatial thinking and analysis				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**Strongly Agree or Agree**
Geography	36	24	14	**48.6**
Anthropology and Archaeology	8	4	18	**26.7**
Environmental and Agricultural Studies	4	1	3	**50.0**
Economics	10	3	13	**38.5**
Political Science, History, and Law	18	5	18	**43.9**
Psychology	0	2	5	**0.0**
Sociology	12	3	19	**35.3**
Computational Sciences	7	3	2	**58.3**
Communication and Information Sciences	3	3	4	**30.0**
Arts and Architecture	1	0	0	**100.0**
Planning and Public Policy	6	1	2	**66.7**
Population and Health	2	3	5	**20.0**
There were 28 respondents who answered the question as Not Applicable to them.				

I currently make extensive use of spatial analysis in my research or teaching			
	Frequency	Percent of 321	Cumulative Percent
Strongly Agree	**87**	**27.1**	**27.1**
Agree	**136**	**42.4**	**69.5**
No Opinion	16	5.0	74.5
Disagree	56	17.4	91.9
Strongly Disagree	19	5.9	97.8
NA	7	2.2	100.0
Total	321	100.0	

I currently make extensive use of spatial analysis in research or teaching							
Current Status	**All Respond.**	**Grad. Student**	**PhD Cand.**	**Post Doc.**	**Untenured Acad.**	**Tenured Acad.**	**Other**
Total	305	30	82	18	57	66	37
Strongly agree or Agree	219	21	59	10	40	50	29
No Opinion	16	3	3	1	3	4	2
Disagree or Strongly Disagree	70	6	20	7	14	12	6
% Strongly agree or Agree	**71.8**	**70.0**	**71.9**	**55.6**	**70.8**	**75.8**	**78.4**
There were 7 respondents who answered the question as Not Applicable to them.							

I currently make extensive use of spatial analysis in my research or teaching				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Geography	71	6	4	**87.7**
Anthropology and Archaeology	21	2	10	**63.6**
Environmental and Agricultural Studies	4	0	4	**50.0**
Economics	18	0	10	**64.3**
Political Science, History, and Law	25	3	14	**59.5**
Psychology	3	0	4	**42.9**
Sociology	23	2	11	**63.9**
Computational Sciences	10	1	1	**83.3**
Communication and Information Sciences	9	0	2	**81.8**
Arts and Architecture	2	0	0	**100.0**
Planning and Public Policy	11	0	2	**84.6**
Population and Health	8	1	4	**61.5**
There were 7 respondents who answered the question as Not Applicable to them.				

I expect spatial perspectives to play a more important role in my future research/teaching			
	Frequency	Percent of 323	Cumulative Percent
Strongly Agree	**158**	**48.9**	**48.9**
Agree	**136**	**41.8**	**90.7**
No Opinion	14	4.3	95.0
Disagree	6	1.9	96.9
Strongly Disagree	2	0.6	97.5
NA	8	2.5	100.0
Total	323	100.0	

I expect spatial perspectives to play a more important role in my future research/teaching							
Current Status	**All Respond**	**Grad. Student**	**PhD Cand.**	**Post Doc.**	**Untenured Acad.**	**Tenured Acad.**	**Other**
Total	307	31	85	18	55	67	36
Strongly agree or Agree	285	30	82	16	52	55	35
No Opinion	14	1	2	2	2	6	1
Disagree or Strongly Disagree	8	0	1	0	1	6	0
% Strongly agree or Agree	**92.8**	**96.8**	**96.5**	**88.9**	**94.5**	**82.1**	**97.2**
There were 7 respondents who answered the question as Not Applicable to them.							

I expect spatial analysis to play a more important role in my future research/teaching:				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Geography	73	6	2	**90.1**
Anthropology and Archaeology	33	1	0	**97.1**
Environmental and Agricultural Studies	8	0	0	**100.0**
Economics	25	1	3	**86.2**
Political Science, History, and Law	37	1	2	**92.5**
Psychology	5	1	1	**71.4**
Sociology	36	0	0	**100.0**
Computational Sciences	11	1	0	**91.7**
Communication and Information Sciences	10	1	0	**90.9**
Arts and Architecture	1	1	0	**50.0**
Planning and Public Policy	14	0	0	**100.0**
Population and Health	14	0	0	**100.0**
There were 7 respondents who answered the question as Not Applicable to them.				

B. Respondents' Awareness of Spatial Perspectives in Disciplines

Increasing evidence of spatial thinking and analysis in my discipline over the last decade							
Current Status	**All Respondents**	**Graduate Student**	**PhD Candidate**	**Post Doc**	**Untenured Academic**	**Tenured Academic**	**Other**
Total	310	30	86	18	55	66	40
Strongly agree or Agree	**272**	**26**	**77**	**15**	**47**	**56**	**37**
No Opinion	22	3	5	1	4	7	1
Disagree or Strongly Disagree	16	1	4	2	4	3	2
% Strongly agree or Agree	**87.7**	**86.7**	**89.5**	**83.3**	**85.5**	**84.8**	**92.5**
There were 3 respondents who answered the question as Not Applicable to them.							

Increasing evidence of spatial analysis in the discipline over the past decade				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Communication and Information Sciences	11	0	0	**100.0**
Planning and Public Policy	13	1	0	**92.9**
Geography	74	4	2	**92.5**
Anthropology and Archaeology	30	3	0	**90.9**
Political Science, History, and Law	39	2	4	**86.7**
Sociology	31	4	1	**86.1**
Population and Health	11	1	1	**84.6**
Computational Sciences	10	2	0	**83.3**
Economics	24	2	3	**82.8**
Environmental and Agricultural Studies	5	1	2	**62.5**
Psychology	4	1	2	**57.1**
Arts and Architecture	1	0	1	**50.0**
There were 3 respondents who answered the question as Not Applicable to them.				

Funding resources are adequate for spatial research in my discipline			
	Frequency	Percent of 321	Cumulative Percent
Strongly Agree	**16**	**5.0**	**5.0**
Agree	**46**	**14.3**	**19.3**
No Opinion	86	26.8	46.1
Disagree	123	38.3	84.4
Strongly Disagree	42	13.1	97.5
NA	8	2.5	100.0
Total	321	100.0	

Funding resources are adequate for spatial research in my discipline							
Current Status	**All Respondents**	**Graduate Student**	**PhD Cand.**	**Post Doc**	**Untenured Academic**	**Tenured Academic**	**Other**
Total	304	30	82	18	55	64	40
Strongly agree or Agree	62	10	18	3	10	18	7
No Opinion	84	8	25	7	16	14	9
Disagree or Strongly Disagree	158	12	39	8	29	39	24
% Strongly agree or Agree	**20.4**	**33.3**	**21.9**	**16.7**	**18.2**	**17.2**	**17.5**
There were 8 respondents who answered the question as Not Applicable to them.							

C. Respondents' Assessments of CSISS Experience

Funding resources are adequate for spatial research in my discipline.				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Geography	24	17	40	**29.6**
Anthropology and Archaeology	4	12	18	**11.7**
Environmental and Agricultural Studies	1	2	5	**12.5**
Economics	5	12	9	**19.2**
Political Science, History, and Law	2	11	31	**4.5**
Psychology	0	3	4	**0.0**
Sociology	11	7	16	**32.4**
Computational Sciences	4	2	5	**36.4**
Communication and Information Sciences	3	3	5	**27.3**
Arts and Architecture	0	0	2	**0.0**
Planning and Public Policy	2	2	9	**15.4**
Population and Health	3	6	4	**23.1**
There were 8 respondents who answered the question as Not Applicable to them.				

My CSISS experience has had positive impacts on my research			
	Frequency	Percent of 231	Cumulative Percent
Strongly Agree	**83**	**35.9**	**35.9**
Agree	**113**	**48.9**	**84.8**
No Opinion	18	7.8	92.6
Disagree	14	6.1	98.7
Strongly Disagree	1	0.4	99.1
NA	2	0.9	100.0
Total	231	100.0	

My CSISS experience has had positive impacts on my research							
Current Status	**All Respondents**	**Graduate Student**	**PhD Cand.**	**Post Doc**	**Untenured Academic**	**Tenured Academic**	**Other**
Total	222	16	57	17	43	55	23
Strongly agree or Agree	192	14	50	14	39	46	19
No Opinion	17	1	3	0	3	6	3
Disagree or Strongly Disagree	13	1	4	3	1	3	1
% Strongly agree or Agree	**86.5**	**87.5**	**87.7**	**82.4**	**90.7**	**83.6**	**82.6**
There were 3 respondents who answered the question as Not Applicable to them.							

My CSISS Experience has had positive impacts on my research				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Geography	54	5	0	**91.5**
Anthropology and Archaeology	18	2	4	**75.0**
Environmental and Agricultural Studies	5	0	0	**100.0**
Economics	17	1	3	**81.0**
Political Science, History, and Law	31	3	2	**86.2**
Psychology	0	3	1	**0.0**
Sociology	25	0	2	**92.6**
Computational Sciences	10	0	0	**100.0**
Communication and Information Sciences	8	1	0	**88.9**
Arts and Architecture	0	1	0	**0.0**
Planning and Public Policy	6	0	1	**86.7**
Population and Health	7	0	0	**100.0**
There were 2 respondents who answered the question as Not Applicable to them.				

My CSISS experience has had positive impacts on my teaching			
	Frequency	Percent of 229	Cumulative Percent
Strongly Agree	**26**	**11.4**	**11.4**
Agree	**73**	**31.9**	**43.2**
No Opinion	56	24.5	67.7
Disagree	17	7.4	75.1
Strongly Disagree	4	1.7	76.9
NA	53	23.1	100.0
Total	229	100.0	

My CSISS experience has had positive impacts on my teaching							
Current Status	**All Respondents**	**Graduate Student**	**PhD Candidate**	**Post Doctorate**	**Untenured Academic**	**Tenured Academic**	**Other**
Total	169	12	37	10	37	51	12
Strongly agree or Agree	97	5	17	3	20	36	9
No Opinion	54	6	16	5	12	10	2
Disagree or Strongly Disagree	18	1	4	2	5	5	1
% Strongly agree or Agree	**57.4**	**41.7**	**45.9**	**30.0**	**54.1**	**70.6**	**75.0**
There were 54 respondents who answered the question as Not Applicable to them.							

My CSISS experience has had a positive impact on my teaching				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Geography	39	11	2	**75.0**
Anthropology and Archaeology	5	10	3	**27.8**
Environmental and Agricultural Studies	2	1	0	**66.7**
Economics	6	3	7	**46.2**
Political Science, History and Law	17	9	4	**56.7**
Psychology	0	3	1	**0.0**
Sociology	8	5	2	**53.3**
Computational Sciences	7	2	1	**70.0**
Communication and Information Sciences	3	3	0	**50.0**
Arts and Architecture	0	1	0	**0.0**
Planning and Public Policy	2	0	1	**66.7**
Population and Health	1	3	0	**25.0**

The intellectual direction of research/teaching has changed based on CSISS			
	Frequency	Percent of 229	Cumulative Percent
Strongly Agree	**31**	**13.5**	**13.5**
Agree	**88**	**38.4**	**52.0**
No Opinion	53	23.1	75.1
Disagree	45	19.7	94.8
Strongly Disagree	7	3.1	97.8
NA	5	2.2	100.0
Total	229	100.0	

The intellectual direction of my research/teaching has changed based on CSISS				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Geography	32	20	8	**53.3**
Anthropology and Archaeology	11	5	7	**47.8**
Environmental and Agricultural Studies	1	2	1	**25.0**
Economics	11	3	6	**55.0**
Political Science, History, and Law	21	7	9	**56.7**
Psychology	0	2	2	**0.0**
Sociology	14	4	7	**56.0**
Computational Sciences	4	3	3	**40.0**
Communication and Information Sciences	6	3	0	**66.7**
Arts and Architecture	0	0	1	**0.0**
Planning and Public Policy	5	0	1	**83.3**
Population and Health	6	0	1	**85.7**
There were 5 respondents who answered the question as Not Applicable to them.				

I make frequent use of CSISS online resources in my research/teaching		
	Participant (% of 225)	**Did not participate** (% of 91)
Strongly Agree	**7 (3.1)**	**1 (1.1)**
Agree	**45 (20.0)**	**17 (18.7)**
No Opinion	39 (17.3)	15 (16.5)
Disagree	101 (44.9)	28 (30.8)
Strongly Disagree	19 (8.4)	19 (20.9)
NA	13 (5.8)	8 (8.8)
No Answer	1 (0.4)	3 (3.3)
Total	225 (100.0)	91 (100.0)

I make frequent use of CSISS online resources in my research/teaching				
Discipline	**Strongly Agree or Agree**	**No Opinion**	**Disagree or Strongly Disagree**	**% Strongly Agree or Agree**
Geography	23	17	38	**29.5**
Anthropology and Archaeology	8	3	24	**24.2**
Environmental and Agricultural Studies	1	3	4	**12.5**
Economics	5	1	22	**17.9**
Political Science, History, and Law	11	5	26	**26.2**
Psychology	0	1	5	**0.0**
Sociology	7	5	22	**20.6**
Computational Sciences	3	3	4	**30.0**
Communication and Information Sciences	2	1	7	**20.0**
Arts and Architecture	0	1	1	**0.0**
Planning and Public Policy	4	5	4	**30.8**
Population and Health	2	2	7	**18.2**
There were 21 respondents who answered the question as Not Applicable to them.				

Recommendations of CSISS Programs and Web Resources by Participants and Non-Participants		
Recommended CSISS Programs and Web Resources to …	**Participated** (% of 225)	**Did not participate** (% of 91)
Students	124 (55.1)	27 (29.7)
Colleagues	165 (73.3)	43 (47.5)
Advisees	27 (12)	9 (9.9)
Professors	54 (24.0)	13 (14.3)
Advisors	14 (6.2)	8 (8.8)
My Class	28 (12.4)	8 (8.8)
Staff	14 (6.2)	8 (8.8)
Other	5 (2.2)	7 (7.7)

Part II Open-ended Responses

Part II provides the actual unabridged subjective commentary to a set of five general questions, organized separately for each question by the disciplines of respondents. No attempt has been made to consolidate these responses.

Open Ended Survey Responses of CSISS Program Applic ants and Participants, March 2003 (Organized by Discipline).

* Indicates a separate respondent.

A3. Please list a few of the most important developments or initiatives that have influenced the growth of spatial perspectives in your discipline (list specific conferences, workshops, publications, funding programs, web resources, etc.) over the last decade.

Geography:

* NCGIA
* CSISS initiatives, NCGIS and NCGIA initiatives that promoted cross-disciplinary interactions, development of spatial data infrastructure and commercial GIS -- specifics are too numerous to report!
* Spatial Analysis and Modeling organized sessions at the AAG meetings have had a positive influence, I believe. The CSISS workshops and web site have also been helpful to the field of geography.
* NSF Digital Library Project Spatial data portal such as USGS, EPA, NSDI/FGDC International GI Science conference.
* Development of agent-based modeling platforms - Swarm, RePast, etc.; growth of agent-based modeling of land use change; MAS/LUCC workshop at Irvine, CA. Conference in 2000; *Journal of Artificial Societies and Social Simulation.*
* Definitely GIS and remote sensing technology!
* GIScience 2000 and 2002 conference.
* We are geographers. Space has always been an important focus in our discipline.
* GIScience 2000 and 2002 Specialist meetings at Santa Barbara.
* Too many developments in my discipline (Geography) have had a spatial perspective.
* AAG meetings, Consortium workshops at the U of M.
* Social Science History Association conferences and publications, Electronic Cultural Atlas Initiative conferences and meetings, History and Computing articles, ESRI Publication.
* NCGIA, Varenius.
* GIS Research UK (conference), GeoComputation (conference), High Parallel Computing (Workshop), *Artificial Intelligence in Geography* (book publication).
* Commercial development of GIS software.
* The influx of complexity theory to the geographical sciences, the use of agent-based modeling tools from computer science and the social sciences, the Geocomputation conference series, the CUPUM conference series, the complexity and geography track sessions at the annual AAG meetings, the biocomplexity priority program at the NSF, the NCGIA and related initiatives.
* Globalization process along with increase computer power has increased interest in spatial interaction, which transcends national scale processes.

* I think in general the advances in GIS and more readily available digital spatial data have had major impact. The work by Luc Anselin, Art Getis, Mike Goodchild, Stan Openshaw, and Stewart Fotheringham, to name just a few, have significantly influenced research using spatial perspectives.
* Difficult to say - probably Open Source software and general information search by Internet.
* The move to digital representation of mapped events, as opposed to the old paper versions, has been a big opportunity for analysis.
* International Conference on GIS in Fisheries Science and Management.
* Lewis, Martin W., and Karen E. Wigen. The Myth of Continents: A Critique of Metageography. Berkeley et al: University of California Press, 1997.
* GIS, Geostatistics, and remote sensing.
* Web resources, online courses.
* CSISS conferences, workshops and meetings; AGILE and NCGIA conferences; Vespucci Summer School; Anselin´s, Bailey & Gatrell´s, Goodchild´s, Longley and Batty´s, Martin´s, Openshaw´s and Turton´s books and articles, amongst others.
* Spatial econometric analysis for spatial dependency and causality analysis.
* Close linkage between GIScience and Spatial Analysis (example NCGIA initiatives, GISci 2000 in Savannah, etc.
* LISA, SpaceStat, GWR.
* Increased software availability. Special issues of scientific journals. Books and edited volumes.
* NCGIA, CSISS, UCGIS, further development of Census and TIGER.
* Availability of workshops on GIS, especially ESRI workshops.
* NCGIA initiative 19 and the emergence of the GIS and society debate have introduced new dialogue between social theorists and scientists. Perhaps we are on the brink of introducing spatial perspectives representing the vernacular and quite possibly non-western perspectives. However, this is yet to be seen.
* CSISS workshop, publications in geographical journals.
* Field research dealing with cognitive mapping of large scale environments, specifically research by Reginald Golledge, M.H. Matthews, David Stea, James Blaut, Robert Kitchens, M. Blades, et al.
* NB my discipline is geography!
* CSISS.
* Computing Power, development of spatial statistics software, Interface to GIS software, improved spatial analysis textbooks.
* Emergence of telecommunication-based economic development strategies.
* Growth of Public Participation GIS.
* CSISS and organized workshops.
* NSF funding for NCGIA and CSISS; new journals; new software (e.g., SpaceStat); integration of GIS and statistical analysis software.
* Large cross sectional data sets and the recognition that spillovers are important.
* Medical geography Symposium Publications in health journals, e.g., health and place, social science and medicine, GISRUK, Geocomputation.
* Bringing GIS into the mainstream. The use of GPS and Remote Sensing products
* Initiation of GIScience conference series; UCGIS, NSF initiatives on digital libraries, digital government, ITR.
* In my sub-discipline of social/human geography, I think that the area of PPGIS has helped integrate spatial analysis into the kinds of social theory analysis that is more commonly used in human geography. There have been one or two conferences solely dedicated to PPGIS, and there are many sessions dedicated to PPGIS at the annual AAG meetings. I believe there has been one issue of *International Journal of Geographical Information Science* devoted to PPGIS.

* Funding from NSF, NIJ.
* GIScience 2000 & 2002 conferences, improvements in GIS software and computing capacity.
* Mobile computing and location based services.
* Developments in the field of spatial epidemiology--now a recognized field with textbooks, journals, knowledge, and researchable questions.
* Internet Mapping has spurred an interest in Location Based Services. The UCSB (CSISS) meeting on LBS marked a very significant change in the profession.
* GIS applications in population health.

Political Science, History and Law:

* Political geography.
* The GIScience conferences.
* Contextual and network theories of politics spatial statistics (Anselin) ecological inference (King).
* Christopher H. Achen and W. Phillips Shively, Cross-Level Inference, Gary King, A Solution to the Ecological Inference Problem.
* Frankly, the only thing I have seen that makes use of spatial analysis is Gary King's aging ROAD dataset, which I have wanted to use but have not had time. As a long-term ABD, I am refocusing on academia after several years of part-time non-profit employment. This survey is a reminder to start looking for spatial research publications to get up-to-date. I will check out CSISS.org shortly.
* 1. Lester J. Cappon, et al. *Atlas of Early American History* (1976) 2. Historical County Boundary Data File Project, Newberry Library, 1976-1982, funded by National Endowment for the Humanities.
* Electronic Cultural Atlas Initiative (ECAI; ecai.org) Old World Traditional Trade Routes Project (www.ciolek.com/owtrad.html) Time Map Project (www.timemap.net) Frank, Andre Gunder, ReORIENT: *Global Economy in the Asian Age*. Berkeley et al: University of California Press, 1998. Knowles, Anne Kelly (ed.). *Past Time, Past Place: GIS in History.* Redlands, CA: ESRI Press.
* Residential patterns of various immigrant and minority groups and its impact on naturalization practices, political participation, and voting patterns is a growing sub field within American Politics, Urban Politics and Policy, and Housing Policy. Without spatial perspective, analyses of contextual and ecological factors on certain policy and political outcomes would be incomplete.
* Development of spatially referenced historical sources.
* Colorado Conference O'Laughlin et al. 2000.
* GIS and the data that GIS projects have generated Development of spatial methodologies/statistics, etc.
* Books and articles by Professor Robert Huckfeldt at Indiana University (recently moved to UC Davis).
* Use of GIS and spatial statistics to analyze race/ethnicity and policy issues.
* Social Science History Association AAG Arts and Humanities Data Service/University of Portsmouth workshops in GIS for the arts and humanities Knowles A.K. (2002).
* Publications and training ICPSR.
* Availability of software, integration with standard packages.
* Publication of Gary King's Solution to the Ecological Inference Problem; NCGIA volume on spatial approaches to political issues.
* Don't know. I am a relative newcomer to working with spatial perspectives.
* In political science, I have not really seen anything contributing toward this area.
* Development of software tools for doing spatial analysis.

* The emergence of affordable and intuitive GIS and Internet data. A few key people, who have shown an interest in spatial analysis, have also had an impact.
* The work of Mike Ward in pushing spatial ideas in the study of IR.
* Availability of data and good analytic methods.
* Mostly the work on spatial aspects of democratization and war. The work by Kristian Gleditsch and Michael Ward stands out in this regard. I am not intimately familiar with the workshops, etc. that have led to this.

Sociology:

* ICPSR conferences; MAPS (formerly CMRC) conferences; the growth of training seminars offering spatial analysis training; growing recognition of the importance of such analysis in the criminal justice community (practitioner and academic).
* NIJ's Crime mapping center National Crime mapping conference Crime mapping news Community oriented policing projects- leading to manuals.
* The availability of CSISS to graduate students in combination with theoretical developments in my discipline for which spatial analysis could prove very fruitful.
* Sunbelt Social Network Analysis conferences.
* Luc Anselin's website and software ICPSR and CSISS workshops.
* Sociology-neighborhood effects, or contextual research could greatly benefit from more spatial analytic techniques and I am trying to incorporate some in my work. I feel that methodologies would benefit and may slowly move in that direction.
* Space and Place, georeferenced U.S. census data available via Internet, Health and Place.
* Crime mapping research center in the national institute of justice (DOJ)
* Proliferation of post-cold war regional security conferences. POSCO Fellowship Program at the East-West Center, Hawaii
* Growing interest in neighborhood effects on stratification processes.
* The Americans with Disabilities Act.
* Luc Anselin's ICPSR course on spatial regression -- I think he has introduced a lot of people to these methods.
* Spatial distribution of genetic resources I must say this is a very poor form of survey question--topic and timeline too broad, people unable & unwilling to research old conferences etc. please improve survey format!!
* Stephen W. Raudenbush and Robert J. Sampson, 1999.
* Robert Sampson's work in neighborhoods. Development of desktop GIS.
* The CSISS center itself; applications in urban/regional, public health and crime research in sociology (i.e., articles by Richard Block).
* PAA (Population Association of America).
* GIS web resources.
* In law enforcement spatial perspectives are seen in the growing area of crime mapping, the advent of powerful but affordable mapping software is bringing the area to investigations of both violent and property crimes. Two annual conferences (one through IACA the second through CMAP) have been keeping analysts abreast of the latest methods, software and success stories involving GIS.
* Health related issues of all types; e.g., healthy & unhealthy places.
* The availability of data and easily accessible and usable software applications.
* Crime mapping, software dedicated to mapping, and funding for it.
* I'm seeing more papers at Sociology conferences (number is still small, but at least now they exist). Mainly these are in urban sociology (my area).

* Biggest one has been the access to geo-coded data and easier software applications.
* GIS technology GIS-related sessions at professional meetings geocoded census data and other social science data.
* An opening up to social geography research and network studies from Europe. Increased access to digitized maps, increased speed on the web and more user-friendly software has all helped.
* Spatial perspectives have become increasingly important in the study of crime; in particular, ESDA and spatial regression have been used to address substantively important topics.

Anthropology and Archaeology:

* The CSISS workshop at the American Anthropological Association (2002) was it.
* Computer Applications in Archaeology, Conferences and Proceedings, Theoretical Roman Archaeology Conferences and Proceedings, Numerous publications on GIS and Archaeology.
* Remote Sensing Landscape Analysis.
* Archaeologies of landscape GIS and Landscape Archaeology.
* Society for American Archaeology workshops and poster sessions on GIS ESRI UC Meetings--the Archaeology sections University of Sydney GIS resources and webpage The Santa Fe Institute's summer programs Society for Anthropological Science (AAA spin-off-just happened).
* Not familiar with any except CSISS programs.
* Workshops, computer training on-line, computer based training software.
* Not positioned to know.
* Simplification and reduction in cost of GIS applications.
* The effort to bring anthropologists into understanding sustainable land use, and the consideration of the conceptual construction of space more generally within the discipline.
* http://csanet.org/index.html http://www.xs4all.nl/~mkosian/computer.html. Recent increase in technical publications specifically for archaeologists.
* While less so for general anthropology, in fisheries there is an increasing emphasis -- in part assisted through the use of Vessel Monitoring Systems. Greater recognition of the fact that fishermen target areas is becoming important in determining social and economic effects of management (which is what my research has focused on).
* Perhaps the most important development is the increased ease with which spatial data (images, maps, datasets, etc.) can be accessed, especially over the web.
* Spillover from geography into anthropology.
* The availability of GIS software. Archaeologists still are not really in to large-scale regional spatial perspectives, but small-scale work is increasing with less expensive software.
* Listed in relative order of personal research influence: the annual Computer Applications in Archaeology conference in Europe.
* There has been growing interest in the constitutive effect of space on social and political relations. In anthropology, my discipline, a number of publication and conceptualizations have refocused on space.
* I'm an archaeologist. Use of GIS in archaeology has increased generally and there are now many experts in this area as compared to 10 years ago when anyone who knew anything about it could be called an expert.
* There was a sense in anthropology (at least for a while) that space or place mattered--but not in a functional sense, rather we approached it in symbolic terms (this is a generalization, not a full picture). GIS can help anthropologists realize the importance of space and place as physically AND symbolically important variables in research (as I have with my own work). Support for the development of GIS in anthropology and archaeology should be critical for the future.

Economics:

* Regional Science Association Conferences, *Journal of Urban Economics*, RSUE, Journal of Regional Science.
* Books by S. Graham & S. Marvin: *Telecommunications and the City* and: *Splintering Urbanism.*
* Luc Anselin's textbooks and publications.
* Anselin, <<Spatial Econometrics>>Boarnet,
* availability of public domain software e.g., www.spatial-econometrics.com, www-spatial-statistics.com RSAI conference sessions focusing on spatial statistics/econometrics web book of regional science spatial econometrics materials.
* SpaceStat/spatial econometrics, GIS to facilitate statistical analysis.
* I don't have a clear idea for questions A3-A7.
* Development economics.
* Over the last five years there has been an increase in the numbers of published research articles incorporating a spatial perspective.
* Don’t know.
* It's not a big part of Economics right now.
* Availability of spatially organized data and computer software to access and analyze it.
* I would take the other track--I think that conferences, workshops, publications, etc. have essentially been inert in persuading policymakers that spatial perspectives matter. Regional and development economics may be enlarging spatial analysis for disciplinary reasons but this has done little to increase the contribution of a spatial perspective to solving social problems. This is not a fault of the particular direction that spatial analysis has taken in the discipline, but a wider crisis in academia that attaches significance to conferences, workshops, publications, etc. whether or not the ideas actually matter. However, I do believe that some policy initiatives have incorporated a spatial perspective that have been influenced more by popular literature than by disciplinary literature. For example, Porter and Piore and Sabel's work regarding clusters.
* Spatial Data Mining Conferences Visualization Conferences.
* Data resources and digital geospatial maps.
* The National Historical GIS Project (University of Minnesota) improved access to the ICPSR data archive
* The emphasis among funding agencies such as NSF and EPA on interdisciplinary environmental research. Better spatially explicit economics data.
* Workshops at WIDER University.

Population and Health:

* Classes at UTD on spatial theory, spatial development, and on use of GIS.
* Software advances making access much easier.
* Liverman, D.M. and National Research Council (U.S.) Committee on the Human Dimensions of Global Change. 1998. People and pixels: linking remote sensing and social science. Washington, D.C.: National Academy Press. Entwisle, B., R.R. Rindfuss, S.J. Walsh, T.P. Evans, and S.R. Curran. 1997.
* Have been solicited by local office of l'UNDP to write a report on the crypto desertification in the Congo, needed by the United Nations Environmental Program (Nairobi, Kenya). Therefore, I realized the importance of this discipline. As a Director in the National Institute of Statistics (DR Congo), I often prepare data collection by probabilistic sampling method on the basis of the unit of habitation (in French).
* Cheap access to software for GIS analysis and GPS technology in the field.
* In relation to research in my country (Italy), the spatial prospective is not still common, it is due to a lack of resources.
* Availability of relatively inexpensive GPS units and remotely sensed data.

* - In the past two years the annual population meeting had a session on spatial analysis in demography. Probably part of the interest started with GIS applications (the same annual conference regularly offers a one day workshop on ArcView basics). A couple of good books linking GIS, spatial models, and demography (or social sciences more broadly) came out recently.
* ESRI health and GIS conferences-inclusion of GIS in EpiInfo Software.
* GIS and health GIS at epidemiology conferences.
* Emerging infectious diseases; inequity in health funding programs.
* GIS in Public Health conferences (annual and biannual). NIH programs to fund spatial analysis of health-environment relationships, including NCI, NIEHS, and CSISS have been important avenues for dissemination among practitioners.
* NAS Workshop leading to the volume *People and Pixels* (1998) NICHD call for proposals on population and land use (1994).

Planning and Public Policy:

* Conference: CUPUM, URISA, NCGIA PPGIS 1998 (Varenius) Book (among others).
* 1. The Environment Management Conferences and its publications. 2. The publication of major GIS Books.
* ESRI Criterion Planners/Engineers (www.crit.com)www.what-if-pss.com Growth Management Planning/ smart growth planning.
* There is no evidence. That is why I want to be the leader.
* The development of widely available web resources and improved desk top technologies (GIS) has been a phenomenon.
* Law enforcement has just barely scratched the surface of possibilities of using spatial perspectives. As a doctoral student, I feel it necessary to herald the news about their utility in analyzing crime, traffic, and other problems that police and neighborhoods must deal with. I am afraid I am not too familiar with conferences, workshops, funding, etc., other than your own.
* University of Colorado, Spatial Analysis workshop Individual conference papers, e.g., presented at the ISA.
* Conferences web resources.
* Anselin's ICPSR classes; Special Issue of *Journal of Quantitative Criminology* devoted to Spatial Analysis of Homicide; National Consortium on Violence Research efforts to promote spatial analysis.
* URISA conferences; Quantifying Density--recent conference at USC and several government-funded publications; Smart Growth Initiative; interest in developing remote sensing applications for urban issues.
* Growing availability of data that contains geographic information and is sampled in such a manner as to be geographically representative. Software has become more readily accessible to non-geographers.
* GIS.
* PPGIS NCGIA Workshop 1996. The NCGIA Core Curriculum on GIScience. John Pickles, 1994 Ground Truth.
* IGERT has significantly contributed to unveiling the field of spatial analysis/geography to academic departments and encouraged cross-pollination between disciplines that would not readily link.
* The U.S. Department of Housing and Urban Development recently funded several projects researching how spatial perspectives could be applied to housing research under a program specifically designed to encourage such research.
* Regional science conferences GIS software networking with colleagues.
* The emphasis on the dispersal of poverty through public and assisted housing programs--so public policy, publications, and conferences.

Computational Sciences (Statistics, Computer Science, and Spatial Analysis):

* Software links between GIS and statistical software packages; wide availability of spatial statistics functionality in freely available software such as R.

* Advent of desktop GIS, web-based GIS, GSDI conferences, National GI infrastructures, Open GIS.
* (a) 1999 NSF/Vareinus Workshop on GIS and Data Mining (b) Symposium on Spatial (and Temporal) Databases (c) ACM Intl. Workshop on Advances in GIS.
* I do not remember any important initiatives in my discipline.
* Availability of spatially indexed information. Development of analytic approaches and display technologies.

Communication and Information Sciences:

* WWW, Advanced Computing.
* Click and mortar e-commerce: The Internet was supposed to render spatial issues irrelevant. However, more and more research focused on the synergy benefits derived from integrating a Web presence with shopping outlets.
* Software/applications tools: S-Plus spatial statistics tools for ArcView. Luc Anselin's SpaceStat.
* For Canada and libraries, the association of CARTA and cartographic information specialists in the field.
* AAG, special interest group on spatial analysis.
* IJCAI-1997 Workshop.

Environmental and Agricultural Studies:

* 1) Development of spatial econometrics packages and resources, especially SpaceStat. 2) Wider availability of spatially explicit data. 3) Attention brought to spatial analysis by Krugman .4) Developments in complexity theory. 5) Increased computing power and development of object oriented programming languages.
* No one in my discipline uses spatial analysis, which is very frustrating. I try to explain and all they think of is maps.
* Watershed GIS Workshop for Educators/Applications of remote sensing for Ag GISESRI Ed UC annual conference.
* In environmental attitude research, the use of a spatial perspective is almost non-existent. To the best of my knowledge there have been no serious initiatives that have addressed this issue.
* NSIF - National Spatial Information Framework. They're responsible for hosting quarterly workshops and conferences regarding new technology or interesting work in the GIS and Remote Sensing Field.
* Mini-Symposium on Integrated Bio-economic Modeling at the conference of Int. Ass. of Agric. Economists in Berlin 2000, Numerous articles on agent-based models which to capture spatial aspects in agriculture and land use, Establishment of specific journals (such as *JASSS*), conferences, and scientific societies dealing with agent-based modeling, computational economics, Cheap computational power, Students with an interest in using computational power.
* Landscape ecology.

Psychology:

* A subgroup of my colleagues conduct studies using social network analysis. I doubt that future research will develop much beyond that.
* The need to provide global trends.

Arts and Architecture:

* ECAI
* Landscape ecology, coupled human and natural systems, urban LTERs.

A4. What new developments or initiatives are forthcoming that could help or hinder the growth of spatial perspectives in your discipline over the next decade?

Geography:

* Development of new tools for analysis such as Agent-based modeling.
* NSF biocomplexity should help.
* Disciplines tend to focus inwards -- and particularly when state and federal fiscal resources become scarce (witness the current budgetary crises of 45+ states) departments tend to recruit in traditional core research areas -- thus tending to stunt and stifle emerging perspectives. However, by providing stimulating opportunities for junior faculty to participate, Initiatives such as CSISS will help promote integration of spatial perspectives within these core areas too.
* More and more geospatial data is available but few in the humanities and in particular history have any idea what to do with it. The universities struggling with shrinking budgets have no time to assess spatial data and analysis as core elements in their curriculum and research centers and a LOT of people (both Professors and Grad Students) have their heads buried in the past...people cannot break out of the publish or perish cycle so they are fixated on peer reviewed journals and don't have any idea what new spatial data and geospatial awareness can offer. Pathetic.
* More and high-quality data Connection with other fields: engineering arts and science etc. Education and training. Wide use of spatial technology, such as low cost GPS.
* Help - continued development of agent-based modeling platforms. Hinder - Poor communication of agent- based modeling developments in journal articles or book chapters. Reluctance to share code or pseudocode hinders the ability of researchers to evaluate replicate and/or learn from the developments made by others.
* Probably higher (& cheaper) PC computational power!
* Climate change human and social dynamics and environment related programs in NASA and NSF.
* Mobile devices make real time spatial analysis possible.
* Participation of geographers in meetings of diverse social science disciplines and interdisciplinary workshops as well as engagement in interdisciplinary research are important strategies for promoting a spatial perspective. Given the increasing interest in spatial perspectives across different disciplines the active promotion of spatial perspectives should fall on fertile ground.
* Object-oriented analysis advancements in techniques for coincident analysis of time and space; improved user interfaces for more intuitive spatial and temporal analysis.
* More stress on formal thinking and simulation.
* High performance computing and GRID-based analysis Artificial Intelligence GeoComputation Hyperspace (Cyberspace) Internet and Wireless communication
* I'm in geography so spatial perspectives are flourishing already. That said, the growth in popularity in social science computing—centers, conferences, publications, graduate-level degree programs, etc.–is one of the most important in my area of study. Geographers have the opportunity to contribute a lot; if they don't, we'll miss out on a chance to infuse spatial perspectives into a lot of the future research agenda.
* Anti-competitive forces could regard spatial interaction modeling not germane to their agendas.
* I think the resources the CSISS website is providing should be very helpful in promoting the growth of spatial perspectives in my discipline. Can't think of a specific one that would hinder the growth.
* Hinder: Lack of access to public data at media-cost only or gratis Technology and software IP concerns DMCA etc. advance: Open Source.
* Increased funding.

* New introductory texts for quantitative methods in geography that have general statistical software plus spatial stat packages all together.
* New Marine Data Model for GIS.
* The homeland security initiative will foster the use of spatial data and hence spatial analysis.
* Unable to keep up with technology as it advances a training gap.
* There are special research groups in my Institute specifically dealing with the topic of Spatial Analysis in Social Sciences. I have not heard of anything new abroad. And I am not aware of many already existent new developments and initiatives.
* Limited spatial econometric tool availability in GIS packages in GIS to handle large datasets.
* Help will come from new algorithms fresh re-analysis of foundation computations in spatial data handling; advances in computing should allow improved spatial representation.
* -More inter-/cross-disciplinary research will positively increase the demand for a richer toolkit of spatial analytic techniques -- widespread adoption of GIS in so many fields should further drive demand for spatial analytics.
* Wider adoptions of open source development practices will definitely help the growth of spatial analysis.
* Model Curriculum in GIS would help the growth.
* Funding shortfalls owing to weakened economy both at the Federal and state levels.
* Oh this is an easy one...market driven GIS! Is GIS science? Can portions of geography be considered science? If it is, then most geography programs in the United States are doing a great disservice to this project by limiting GIS courses to the teaching and propagation of ESRI products. Let me put it to you this way...most GIS courses in the United States featuring ESRI products resemble little more than technical or trade school courses. Let me explain...geography needs students, students want to learn GIS software, students do not want to learn GIS theory, students do not what to learn cartographic theory, students want to build up tools to impress Bill Gates types...not carry on the work of Tobler, Goodchild, Mark Woodorm Harley. Students say ramp me up and set me up for job interviews. Professors are forced to meet this demand while neglecting theory (see AAG 2003 conference on GIS teaching in undergrad. institutions). Is this what geography and GIscience wants? If so OK let's move on. If you don't think this is a problem just check outside the gates of UCSB and SUNY-Buffalo...it's a problem. As a second point think of it this way...how many introductions to chemistry courses, organic chemistry, intro physics, calculus, and Zoology cater to the demands of the market corporate interests and disgruntled undergraduate students? None. Pre-med, pre- vet, pre- law pre-teaching, basket weaving, chemical tech majors are all in the same course and all must meet the rigorous standards of the science and discipline. Not geography and GIS. On the contrary, we promote a single GIS product by teaching and training only on ESRI products...we advertise for new faculty by demanding skills in Arc-this and Arc-that. Give me a physical break...most geography programs are nothing more than ESRI training grounds. Wonder why geography and spatial scientists get little respect in the REAL world of science? Wake up GEOGRAPHY, we've got the skills and intellect to contribute to a real spatial science socially conscious GIS and new ways of understanding a very complex world. Let's no be junkies dependent on a single dealer. Don't we have the confidence to develop our own GISs? Are we too content? Are we too lazy? And please let's quit sweeping the issue under the table by not listing what GIS software we are using in journal articles or in classes taught at universities (we are not suppose to mention or promote the following software...like that is really objective...come on...let's rethink all this nonsense before it is too late and once again geography is left behind by a more progressive and innovative discipline.
* Reduced grant funding could hinder growth. On the other hand there are new initiatives in the area of epidemiology where the spatial perspective is used. This will help the growth of the spatial perspective.
* Help: More cross-disciplinary research between environmental psychology geography education. Hinder: Continued reliance upon outdated educational theories about how children think/learn spatially.
* Hinder: Post-modernism.
* Help: inventory of advanced telecommunications infrastructure.
* Attention to integration of qualitative forms of research into GIS.

* Biggest problem in geography is the paucity of students with basic math skills and the rejection by a large segment of human geography of any kind of formal analysis, including statistical analysis.
* Data access, Proprietary GIS removing less commonly used functionality, which are crucial to the GIS community.
* Hindrance on Freedom of information.
* Unfortunately, the current federal administration is pro-war. My field (research cartography) tends to grow fastest in support of wartime technologies. Other boons for GIS and spatial analysis are coming from emerging interests in biodiversity, nanotechnology, and information management hindrances all relate to budget.
* Funding for anti-terrorism as well as public health kinds of research.
* There seems to be an interest in integrating feminist theory into GIS - Feminist perspectives influencing the development of software and the discourse.
* Difficulties of using and developing business application for spatial software.
* Decreasing access to spatial data due to concerns for privacy of data on individuals and new regulations to limit access to spatial data (HIPAA regulations April 2003).
* Initiatives related to Homeland Security could help or hinder growth of spatial perspectives.
* Mainstream statisticians' participations in spatial enabled technology.

Political Science, History, and Law:

* Spatial models or network models.
* Digital object identifiers.
* Sustainable development including urban planning and community development as well as parks and green space protection.
* Two emerging developments are likely to enhance the likelihood that spatial analysis will grow in importance. The rapid increase in availability of Bayesian statistical strategies is likely to add a new dimension to spatial analysis. And the rapid increase in the use of agent based models will lead to an increase in multi-level explanations which inevitably give rise to observations ordered in space.
* I am not familiar with the newest development.
* My guess would be integrating individual-level survey data with spatial aggregates in some kind of hierarchical or relational data modeling. The first thing that comes to mind is Bob Putnam's Saguaro Seminar and the huge Social Capital Benchmark survey which includes a national survey and special samples from dozens of local communities across the U.S. totaling tens of thousands of respondents. It seems ripe for spatial analysis using both controls for spatial autocorrelation and for accessibility by road and broadcast media. Other long-term survey projects like the GSS and NES probably have enough respondents now to facilitate cross-sectional time-series spatial analysis of counties or states on some variables.
* 1. Creation of historical geographic data files to serve as the base maps or infrastructure for historical GIS work as in the Atlas of Historical County Boundaries the national GIS projects for China Great Britain Germany Belgium and the United States. 2. Increasing simplicity power and ease of use of GIS software coming.
* Development of GIS-based graduate programs especially in the area of Historic Resources Management. Lack of funding for such research in the discipline of History in part because peer-review committees seldom have a member who understands research or teaching programs that focus on spatial analysis in historical studies. Lack of graduate training in History in crucial areas such as Cartography and GIS.
* Lack funding will hinder its growth.
* As a young political scientist, I have already began establishing contacts with Ph.D. students and professors in Geography and Cartography departments and greatly benefited from their expertise for my research. I believe scholars in social sciences who would like to develop spatial perspectives greatly benefit from such interactions.

* More funding looks likely; good software developments; the conversion of scholars to regard space and time as important.
* The development of aggregate data analysis technique may foster spatial thinking in political science.
* There is a need to be able to conduct spatial regression using multiple control variables to protect against spuriousness and false inferences.
* Large historical spatial databases are becoming increasingly available removing one barrier to entry into spatial approaches to history but there still remains a need for increased training in software and awareness of techniques particularly at a fairly basic level.
* Help: more publicity and more concrete convincing applications in order to show that spatial perspectives are useful in political science.
* None come to mind.
* As yet there has been no CSISS or other effort to sort out the state of ecological inference in political science in the wake of King's book and the various critiques launched by Anselin and others coming out of geography. Nor are there training programs to make this type of thinking a core part of methodology training within political science.

* Decline in funding will hinder growth in a new field; better software and more availability of GIS should help.
* Further development of software tools and statistical training workshops.
* Not sure.
* Emphasis on individualistic modes of thinking rather than contextual or holistic modes.
* Available moneys collegial support for empirical analysis time to actually do it!

Sociology:

* International Association of Crime Analysts is developing a formal national certification program one aspect of which is training in spatial analysis.
* Only few colleges/universities have courses on Spatial perspectives in my field i.e., criminal justice. Encouraging universities in developing courses such as crime mapping will help many students get interested in spatial perspectives.
* Interest is not a problem but learning spatial analysis techniques seems like a daunting task. Therefore, availability of resources and funding are crucial to keeping spatial perspectives viable in my discipline.
* High cost of spatial analysis software.
* An appreciation of interdisciplinary perspectives is certainly helping sociological research methodologies.
* Lack of recognized outlets for publication of research using a spatial approach coinciding with ever-stronger pressure to get publications out quickly in highly regarded journals.
* Previous answered questions to this survey.
* Regional resistance to globalization.
* Endogeneity is always a big problem. It helps to have longitudinal data then have better computing.
* I have no idea.
* What we need are INEXPENSIVE GIS software and spatial regression software that are integrated into regular software packages like SPSS. The software from the spatial analysis course I took with Luc Anselin was too hard to use so I never tried it when I got back home.
* The development of easy-to-use statistical software.
* Training needed is daunting. Funding for development could help and for instrumentation.
* social justice.

* On the one hand there is a renewed interest in space/place/context more broadly in urban sociology as well as the continuing development of hierarchical linear models (recently available for the first time on SPSS) which nest outcomes in contexts which fits well with the mission of CSISS. On the other hand there is also a lot of emphasis on globalization network exchanges and internet research that try to model relationships independent of physical location.
* To convince grant/contract institutions that acquiring the necessary software such as Arc Info could help to broaden the research horizon and provide additional important research windows.
* New spatial analytic tools.
* The increasing concern over personal data confidentiality is going to make it harder to use spatially precise interview data.
* Cheaper easier to learn and use GIS software - great automation greater integration with other software (e.g., stats analysis databases web interactivity).
* Less federal $$$.
* More data with geographic references will help growth. Heightened concern (or abuse by researchers) of confidentiality.
* I think the main problems are 1) data availability and 2) lack of methodological training. Spatial statistics are not addressed in sociology texts or in many graduate programs in sociology.
* Methodological issues: auto-correlation Theoretical framing of issues: how good are our pictures in their (re)presentation of data; does the picture become the story??
* Statistical model with spatial components.
* Increasing dialogue between social and natural sciences.
* A major obstacle to the growth of spatial perspectives is the lack of data with fine geographic detail over extended periods of time.

Anthropology and Archaeology:

* If a few anthropologists are selected to participate in your week-long conferences, that would help.
* Concentration on cognition and symbolic meaning of material culture.
* Data conversion, over dependency upon ESRI, over open source applications in teaching.
* Interdisciplinary analyses of paleoecology and human impacts on a regional scale Site-level GIS interpolation.
* The growth of GIS technology at a pace that is too fast for many in the discipline to follow resulting in the dismissal of this type of analysis as a valid methodology.
* Helps-Operationalizing agent-based models via GIS; Using GIS as a field management tool. Hinderers-Postmodern and-or non-scientific archaeological and anthropological accounts.
* Lack of funding.
* GIS software and other computer programs promoting spatial analysis should set up at conferences to explain how computerized spatial analysis could help in their respective fields such as the Society for Applied Anthropology in March or other such discipline conferences where academia and practitioners join to share new ideas.
* Teaching tools such as data and exercises as well as free software tools for spatial analysis are essential.
* An unorganized or unregimented use of technological tools that could risk data security storage and therefore result in the loss or corruption of data.
* University site licensing of GIS software has helped a great deal.
* Lack of training. Uncritical application of the technology may hinder future use.
* GIS analysis will become more and more important in urban sociology.
* It will just keep growing.

* Okay I don't know if this is what you want but it seems to me that a war in Iraqi and what I feel is the continued mismanagement of US Federal budget--including the portrayal of government as a bad thing that we should reduce in size and scope will have far more negative impacts than any other possible development within the academic community. In other words, the petty squabbles within disciplines while important don't seem nearly as important as the general direction our government takes in its mandates to us as researchers. I would like to think that research including GIS/GPS based work can find an important place in our nation's agenda for growth and development, unfortunately, it does not appear to me that that is the case.
* Opportunities to learn how to do the analysis and use the programs.

Economics:

* Help: growing ICT-communications.
* Volume of Advances in Econometrics devoted to spatial econometrics Journal issues devoted to spatial statistics/econometrics e.g., *Geographical Analysis, Journal of Econometrics.*
* Economical research.
* Don’t know.
* None that I know of. It’s getting more difficult to get data with geographic identifiers not easier.
* No opinion.
* Already hindering the development of spatial perspectives is the belief by some disciplinary researchers that space is the missing piece of realism that the discipline (e.g. neoclassical economics) can be saved by merely taking better account of space. Discipline is probably better termed doctrine and space is being embedded across disciplines to demonstrate that any particular discipline is the one true faith. I believe a theoretically agnostic approach would do much more to increase the spatial sophistication and fertility of analysis that can then truly draw off interdisciplinary interaction. I believe agent based modeling might contribute to this objective.
* Need some theory!! and better statistical methods.
* Efforts to systematize spatial data and make them easier to use.
* State budgetary problems that would cut back on collection and development of spatially explicit economic data.
* Globalization Information revolution and particularly from grass root levels.

Population and Health:

* Classes such as introduction to spatial econometrics or spatial analysis in the syllabi should be promoted at undergrad level and at the graduate level; more emphasis should be given for research.
* Spatial patterns of minority development in China.
* No comment.
* Spatial regression analysis.
* 1) More integrated and easier to use geostatistical applications 2) Geographically weighted regressions. 3) Bayesian statistical modeling for local area estimations. 4) Greater access to public remote sensing imagery and easier to use software application for image analysis.
* -Internal migration with respect to the agriculture concern sand to the social issues resulting from a forced cohabitation of traditional authority in the rural area or city, and anarchic occupation and subpopulation. -National census preparation. -National elections preparation. -Improvement of the health institution accessibility by correcting their distribution through the country with respects to the population distribution and possible redistribution.
* Don't know.

* New initiatives to address issues such as protection of confidentiality and geospatial data improved accuracy and comprehensiveness of geospatial data collection and surveillance and further development of appropriate spatial analysis given data scale and gaps.
* - Some statistical packages (such as SPlus) are including spatial models, which open a new perspective to researches that do not write programs and heavily depend on availability of software. Increased evidence of the strong spatial characteristic of some social events highlighted in a couple of recent papers will certainly stimulate new research.
* -Funding-training of appropriate staff.
* More user-friendly software links with GIS.
* Excessive reliance on GIS technicians with little understanding of statistics or geography.
* Applications of GIScience in the evaluation of health/environment relationships continue to expand. Budgetary constraints from our Government's deficit spending could lead to cuts in SA support.
* NSF Coupled Human and Social Systems Initiative. Availability of tools that are increasingly easy to learn and apply on their use.

Planning and Public Policy:

* Planning Support Systems and Public Participation GIS research curricula workshop.
* The availability of GIS to community-based groups (e.g., www.bnia.org) The future of the sustainability indicators movement (dependent on funding interesting results) The shift from smart growth to more integrated sustainable development planning requiring more sophisticated spatial tools.
* Availability of funds for example to attend some training.
* Budget contractions are really a problem for public sector and non-profit entities hoping to acquire/update technology and limits training and educational opportunities.
* Funding! Or the lack of it! Satellite imageries are getting more and more expensive. Research grants are getting scarcer.
* Law enforcement sometimes operates from a crisis mentality and focuses on whatever the most pressing problem is at the moment. In its haste to react to homeland security needs we may overlook the wide range of problems that spatial relationships could assist in handling (including homeland security).
* Continuously growing attention to the use of statistics as a tool to correct for spatial dependency.
* Regional initiatives (especially in my country-Italy).
* Combining spatial analysis with social network to create a more robust methodology for identifying non-random distributions of events and to identify the mechanisms of spread.
* A continued gap between the physical and social sciences when it comes to the application of remote sensing and spatial statistics.
* I think in my discipline it would be nice to have a well-publicized geographic data clearinghouse where scholars could easily download a range of files online. The ability of scholars and practitioners to link spatial perspectives to program implementation and policy analysis will also be a key engine of growth.
* I assume that there will be improved theories and methods that would increase the predictability of models.
* Internet GISVRML and 3D Modelling.
* More resources so that there is more time for research.
* The lack of financial support in specific fields for the technical infrastructure needed to implement such work.
* I think the continued incorporation of these tools into applied areas, e.g., intelligence and policy analysis will give rise to a growth in the spatial perspective. In addition funding initiatives from institutions such as DARPA and NSF will like aid the cause.

Computational Sciences (Statistics, Computer Science, Spatial Analysis):

* Help: European INSPIRE initiative based on Open GIS. Hinder: a diverse set of National regulations regarding data formats and processes.
* (a) Location based services over wireless clients (b) Pattern mining of spatial data sets, e.g., Earth Science.
* Teaching spatial statistics in the universities.
* Help: Data at a finer spatial resolution. Continued development of technologies. Hinder: Privacy and confidentiality concerns.

Communication and Information Sciences:

* Over-time mapping spatial statistics.
* Spatial variables can be used to understand the use of new technology such as the Internet e-commerce and CSCW.
* Continued developments of spatial statistical tools.
* A growing understanding of how a thorough grounding in information science principles can be an essential skill set to anyone working with GIS.
* IJCAI-2003 Workshop.

Environmental and Agricultural Studies:

* Access and resolution costs.
* Publicity.
* Lack of funding Lack of professional development for educators due to testing and language arts focus.
* There is a greater realization that space and place plays a role in determining processes and patterns in the landscape. This realization although slow in coming is the foundation on which environmental attitude research will increasingly incorporate a spatial component.
* Ph.D. thesis on spatial (and temporal) perspectives for environmental sciences.
* 1) Acceptance or not of simulation-based research methodologies. 2) Availability of data especially spatially explicit socioeconomic data. 3) Wider development of simulation-based programming tools. 4) Development of verification and validation methodology for simulation models. 5) Development of techniques for spatial dissagregation of socioeconomic (especially census) data.
* Web Internet Map Services could change the way we represent findings for the better.
* Pro Further establishment of specific journals, such as *JASSS*; Political developments such as the 6th Framework Programme of the European Union dealing with aspects like multifunctionality and land-use. Availability of GIS-data, Contra Missing expertise in managing complex models, General difficulties to manage interdisciplinary research teams.

Psychology:

* fMRI studies the influx of neuroscience techniques in the behavioral sciences.
* All new research coming out pushes new perspectives; increasing use of GIS by social scientists is important.
* Lack of funding will hinder growth; new mapping software developments and the use of maps in communicating complex concepts will help promote this specialty.

Arts and Architecture:

* Government or private support for spatially indexed cultural resources.

A5. Please identify (list) any programmatic or resource needs for spatial social science research and teaching in the near future that are not likely to be met adequately by CSISS or by other institutions.

Geography:

Further work on core curricula with UCGIS.

* I think the need for more user-friendly software applications - especially ones that easily bridge the gap between GIS and spatial modeling - is the single most important issue facing spatial social science research and teaching.
* A way to allow the student in travel behavior/transportation to interactively build and visualize time-space paths/prism.
* Social science data survey and sampling and how to evaluate and control the data quality, measurement level, etc. for proper use in GIS.
* Some sort of a common language (pseudocode) for conveying the structure models. A clearinghouse or central repository for such pseudocode.
* Guideline for Spatial Research in various levels (intro, intermediate, advanced, graduate).
* Perhaps a workshop in which we can first meet to initiate a particular research topical area, then go back to our own institutions to work out research projects (proposals or white papers), and then get together again in a meeting to synthesize and integrate ideas and outlines.
* Not enough funds for software development.
* I think the biggest challenge is to provide a comprehensive training of the new cohorts of grad students in diverse spatial perspectives - from GIS and quantitative spatial analysis to spatial ethnographies. As it stands, most graduate students are acquiring expertise in one particular spatial perspective, at the neglect of the other.
* Providing academics the basic skills necessary to join the world of spatial analysis -- e.g., database design and development, geocoding, translating between ontologies, etc.
* Funding for theoretical research.
* High performance computing (GRID), Artificial Intelligence.
* Computing skills with spatial perspectives; CSISS tried with an agent-based modeling workshop, but it's not an easy task.
* I think CSISS is providing some very valuable resources for research and teaching. What we as teachers need are teaching modules for specific spatial analytic techniques.
* Difficult to say.
* NA: I am not a social scientist.
* The integration of time into GIS software and spatial statistical analysis.
* None.
* Training gap.
* As in A6.
* -See my note below.
* More general access to micro-level socioeconomic data. To date this has been very difficult to work with, as access has been limited to a few scholars who must work on site (at Census or BLS).
* Visualization approaches to analysis could be further developed.
* Research grants and awards are certainly going to be missing with poor state of the national economy and subsequent shortfall in investments by major giving organizations.

* There needs to be more emphasis upon the integration of qualitative research and GIS, solid foundations of uncertainty and fuzziness theory...we're not dealing with rocks or stationary points here. These items are in great need of research(ers).
* Spatial social science research has the potential to advance cross-disciplinary research, especially in the health and medical fields. This need is not likely to be met without external grant support and willingness of more faculty to work across disciplines.
* Field research designed to evaluate the effectiveness of existing geographic education programs/activities, such as ARGUS, National Geography Awareness Week, NGS Summer Institutes, etc. as determinants of the public's geographic/environmental understanding.
* More integrated GIS and Spatial software tools. Allow researcher to focus on research, not statistical programming.
* N/A.
* Emphasis on qualitative research.
* More dissemination and training in basic spatial statistical analysis techniques. More short courses and workshops for grad students and beginning faculty. More funding from NSF for these efforts.
* Strong metadata regarding subnational boundary changes over time.
* International access (and/or cost of) to spatial data sets – e.g., access to census data from abroad.
* Need for training and workshops that are at no cost for graduate students, and perhaps undergraduates. The main reason why I didn't attend the workshop I was accepted for was cost.
* K-12 resources: computing instructions, and lecture instructions.
* CSISS is doing a fine job
* Computational aspects of spatial analysis, i.e., informatics, programming for spatial modeling, etc.
* None.
* The few excellent doctoral programs that serve this field.
* I am no longer in academia. I am focused on applications as opposed to pure research. I do not have an informed opinion on CSISS in respect to this or the following questions.
* Short (3-6 months) collaborative programs of 2 scholars from different discipline working together at the CSISS center.

Political Science, History, and Law:

* Nothing to list.
* Introductory courses in spatial analysis in the context of 'Why space is important to you'.
* Marriage of Bayesian spatial analysis with CSISS programs, especially GeoBUGS operating under WinBUGS. This is probably a turf war issue.
* I do not have a clear idea.
* I am unclear all the ways that CSISS support spatial data analysis, so this question is difficult to respond to.
* GIS to analyze change over time. Handling uncertainty in GIS.
* I feel that CSISS meets my educational needs.
* CSISS should promote training in open source GIS such as GRASS. Proprietary programs such as ESRI are prohibitively expensive for researchers like myself at universities without site licenses.
* See above -- the specialist workshop on inequality was great, but it would also be good to have one specifically on ecological approaches to political participation that would include not only leading edge practitioners of the technology, but the next group who want to advance into practical applications (where I would classify myself and my students.).
* Don't know.

* More geocoded data. More example datasets for teaching purposes. We need more people to develop courses and teach what Luc Anselin is teaching at ICPSR and elsewhere.
* It would be nice to have some syllabi specific to my discipline for spatial analysis. However, it would be a bit much to expect this from CSISS.
* Nothing more than you are doing, but perhaps more advertisement. For example, listing across the Political Methodology Listserve and similar things.
* Money, release from teaching.
* One significant weakness throughout social science, which is likely to be particularly painful in spatial analysis, is a lack of training resources in graphic design principles and visual data presentation. We teach people what their numbers mean and give them an automated tool to make graphics, but few actually get training in the optical side effects of various design choices. I suggest a full-blown weeks-long workshop intended to train scholars from soup to nuts, building theory, doing spatial analysis, presenting and interpreting numerical results and producing professional-quality finished maps and graphics all the way to the end product, using Adobe Illustrator, CorelDraw or other publishing software to touch up and customize results with transparency effects.

Sociology:

* California has a pretty bad budget problem that will hinder training efforts for practitioners and students alike.
* My university (Northwestern) and other institutions in the area have begun to offer introductory seminars, mostly informally, on spatial analysis--however, little attempt has been made so far to integrate spatial analysis into the formal curriculum. The absence of geography department at NWU also limits the resources available locally.
* NA
* It would be useful if there were curricula developed for teaching spatial perspectives on social science (i.e., a sourcebook of syllabi and materials which others had developed and were willing to share) to facilitate mounting such a course.
* Previous answered questions to this survey
* Geospatial measurement of security identities.
* I don't know enough about CSISS to offer an opinion.
* Give us Windows and Mac spatial analysis programs that are easy to use. I shouldn't have to create my adjacency matrices in some other format first.
* Methodologies for integration of spatially structured biological and social data.
* Although the ideas of space and spatial ordering are important in sociological thinking, there are few studies that explicitly incorporate such concepts in statistical modeling (e.g., the spread of concentration of urban underclass).
* Research about social justice in third world.
* Software funding is always an issue in cash-strapped schools.
* I learned many techniques at CSISS using ArcInfo. This software is not available in my workplace for now.
* More web based resources.
* I think CSISS does a good job in their summer workshops of training people who are new to GIS and people who have strong statistical skills, but I am less sure that CSISS does as good a job in these workshops with people who have GIS skills and basic statistical proficiency, but who may be overwhelmed by heavy duty statistics. I would also like to see some forum for discussing ways in which already developed GIS techniques can be applied to substantive issues and fields they were not originally designed for and for thinking about how currently used GIS techniques can be melded with non-GIS methods currently used by many social scientists.
* Can’t think of any right now.
* New data that is not properly documented.

* Data, and good models illustrating spatial analyses of sociological processes -- from theoretical development, to conceptualization, to data analysis. It's not hard to learn to display the data in maps -- rigorous analysis is another story.
* Uniformity in data sets and software standards.
* I need one-on-one consultation about updating old GIS files in Atlas and have hit a wall in trying to get assistance. Also, there is no GIS software available in my department, thus most of what I learned at the workshop has been moot.

Anthropology and Archaeology:

* Need more university courses in remote sensing applications, theory, and techniques.
* Remote sensing database development at high resolution.
* Courses on agent-based models that are GIS specific.
* Introductory classes in basic spatial analysis, (On-line or summer workshops). What is GIS? How to use GIS software. Which programs are more user friendly?
* Funding for graduate students focusing on spatial social science research.
* A centralized repository of syllabi, data set examples, and teaching exercises as well as free software tools.
* More effort should be taken in the organization of guest speakers and presentation topics, so that all in attendance could in some fashion benefit. As an archaeologist, the heavy emphasis on modern, urban planning left little to no presented topics that demonstrated new or interesting ways in which spatial research could benefit my particular research objectives.
* One issue I see is that spatial studies may be highly beneficial as a focus for interdisciplinary studies, and I'm not sure that I see it being used enough for that purpose. It would be great to mix (for fisheries in particular) physical and social science information to better get at how decisions are made prior to management and then what the effects of management are likely to be. I'm sure this could spill over to a number of other important environmental questions beyond just the marine realm.
* Although spatial data are more available, some sources such as Landsat imagery remain very expensive. Those doing research without the aim of generating profit from the results are forced to pay the same prices for these data as those using them in commercial applications. I do not see how this problem can be dealt with by CSISS.
* Archaeologists don't have the basic knowledge to pass on. As a substitute, geographers are usually used, but do not approach the same problems in the same ways.
* Incorporation of spatial analysis into cultural studies, broadly defined. CSISS seems to have an NSF-style conception of social sciences, with an emphasis on SCIENCE that short shrifts the critical cultural analysis found in many social science disciplines at this point.
* It would grow faster if there were short courses that would allow faculty to quickly learn the basics of desktop GIS applications as opposed to expensive systems requiring sun microsystems workstations, etc. Most faculties have no interest in doing a new Ph.D. in GIS and want a quick and dirty lesson to get them going. These short courses cannot be based at CSISS, since very few can be funded to take them, and they cannot run during the summer when any anthropologist worth anything is probably in the field for 8 weeks.
* I'd like more generalized programs--something tailored for anthropology/archaeology and not so geography centered would also be useful.

Economics:

* No idea.
* What is lacking cannot be fulfilled by CSISS, more classes on the subject need to be taught at the university, graduate level.

* Geographic matched economic data Ready-to-use estimation software.
* A new textbook in this area is needed.
* Economical index data.
* Would like to see the program expanded to include spatial applications in other disciplines such as business. For example, my research experiences with colleagues from various business disciplines suggest a ready audience.
* Not sure - I really am new to this and hoped to learn about it.
* No opinion.
* Connection to real policy problems.
* Funding.

Population and Health:

* Probably grants for research in topics different than geography, for instance health economics, population economics, etc.
* No comment.
* Globally, issues on the developing World: to enhance the level of the conception, the elaboration, the implementation, the follow up of the development programs and social data analysis.
* Don't know. I'm not presently familiar with CSISS or other institutions, or the needs they are presently meeting.
* I think that CSISS does a remarkable job in training professionals, and opening their minds for spatial thinking. However, I strongly believe that major demography centers should have regular classes on, what could be called, spatial demography. This would certainly launch the interest a much larger number of students.
* Deductive market analytics in health services; policy analyses with crosswalks of demographics and political districts.

Planning and Public Policy:

* Do not know.
* I would like to suggest interaction between CSISS and other universities outside the USA. Sharing experiences through short visits to other countries (e.g., Portugal) would help increase the promotion of spatial social science research.
* Spatial resources for smaller nonprofit and community-based organization involved in neighborhood planning and indicator development. Greater data availability, at larger scales in the U.S. as well as in other countries, especially Canada.
* I'm sorry, I don't feel prepared to answer this question.
* Introducing an economical GIS system capable of interfacing with current computer-aided dispatch systems to law enforcement agencies & municipal governments. Further assistance would be needed to show research/planning applications.
* I don't know.
* No comment--hoping to develop a perspective on this after a workshop this year.
* Luc Anselin's workshop in Michigan sounds very interesting but is currently too expensive for me.
* Web-based Planning and Scenario Visualization.
* Moving toward the ability to more easily incorporate spatial attributes in the analytical process would be helpful. More specifically, many of the tools require users to have a level of competence that may reduce its inclusions into the teaching endeavor.

Computational Sciences (Statistics, Computer Science, Spatial Analysis):

* Need for textbooks on spatial topics beyond first course on GIS.

* Professional statisticians should be involved in teaching. Would you like to learn about geography from a statistician? However, with a few exceptions, CSISS instructors in spatial statistics are geographers or engineers.
* None come to mind.

Communication and Information Sciences:

* Tool availability
* Software development.

Environmental and Agricultural Studies:

* Seed grants.
* Lack of processing power (e.g., for ArcGIS) at schools/computer labs.
* CSISS training program is unable to cope with the demands. CSISS is not widely known as say for example NCGIA The core technical associates of CSISS are top-notch The management team is top-notch too.
* 1) Simple, easy to use, free models that can be used for demonstration purposes and student projects. 2) Better training for simulation/programming-based spatial modeling. 3) Better availability of spatially explicit socioeconomic data.
* No opinion.
* Although there exist many conferences and workshops where ongoing research can be presented, bringing existing research teams together in order to present and discuss ongoing research and to develop joint research, like, e.g., the workshop on agent-based modeling of land use would be valuable! The problem of classical workshops and conferences is just that there are just presentations with little discussion. After the presentations, nothing happens.
* Operation research (e.g., how could human behavior be adjusted so that it will pose less impact on the natural environment)

Arts and Architecture:

* Content development.
* Need to include design and planning and normative approaches to spatial social science research. Need to bring approaches to generating proposals for landscape change into the framework for analyzing and/or predicting landscape change.

A6. Please identify (list) what you consider to be the most significant programmatic or resource needs for spatial social science research and teaching for the next decade.

Geography:

* Hmmm. I'm not ready to give away my current proposal until it's submitted!
* I think the need for more user-friendly software applications - especially ones that easily bridge the gap between GIS and spatial modeling - is the single most important issue facing spatial social science research and teaching.
* Spatial analysis methods. Integrated methods to model the spatial and temporal components in a single framework in a research topic.
* Basic training in what GIS is, what it can be used to do, and what it DOESN'T do. Many have all kinds of pie-in-the-sky ideas about spatial analysis and thematic mapping and haven't got a clue as to what problems they face... as a

result, many funded projects end up in a shambles, without clear results or long-term utility to anybody, and once burned the people who plunged in unprepared end up giving GIS a bad review. The same argument that happened in the social sciences over the use of statistics is STILL happening in the GIS academic sector, while the private sector zooms ahead.

* Strong and useful application to convince people that this approach can help solve problems.
* Some sort of a common language (pseudocode) for conveying the structure models. A clearinghouse or central repository for such pseudocode.
* Bigger push to adapt Spatial Analysis as requirement in Graduate level study!
* Training and updates of new ideas, theories, and technologies.
* Most social scientists do not pay attention to GIS methods because they are satisfied within their methods and do not test new GIS methods, although, I think, they are quite useful.
* Based on my comments on A5, I think the most significant need in terms of teaching is the development of a curriculum of comprehensive spatial perspectives.
* Robust, web-based analytical tools that can be used by a scholar with minimal technical skills - that can take advantage of the increasing number of rich, web data services.
* Simulation tools.
* Internet, e-business, metadata, data sharing strategies, quantitative and computational analysis techniques and methods.
* Solid math and statistics training for geographers. Better commercially available tools.
* Computer programming, dataware, spatial cognition, location-based services, spatial analysis.
* Networking or spatial interaction among those interested in this type of research. Recognition that this research competes with other research in a competitive marketplace of ideas, one should not take SI for granted, it could be put on the back bench of academia very quickly.
* More sophisticated, yet easy to use software programs and high quality data are two things I would put on the top of the list.
* More focus on empowering users and students by enabling them to program.
* N/A: I am not a social scientist.
* Retraining those of us who learned statistics one place, GIS another place, fears of the boogieman of spatial autocorrelation, and has not put it all together.
* A more basic understanding of the relevance of scale in elucidating research questions and answering those questions.
* Internet-based research sources.
* In developing countries, it looks like that issues related to socio-economic disparities (like social inclusion or exclusion of certain communities) may be a significant programmatic need for spatial social science research and teaching, particularly because this supports the implementation of social public policies.
* Well-designed textbooks on spatial econometric analysis with a dataset and exercises in an integrated GIS environment.
* Programmatically, the central role of spatial analysis in the social sciences needs to be promoted; geographers in particular can emerge with enhanced credibility in the analytical social sciences as we deal with [and have curiosity about] spatial process, clustering, neighborhood effects, spillovers, etc.
* In my experience, the single most significant resource problem to advancing the cause of spatial analysis within the social sciences is the LACK of a free, integrated, robust, and powerful suite of software with which to conduct spatial analysis. I've used SpaceStat, GWR 2.0, S-Plus, routines in MatLab, Gauss routines, scripts/extensions in ArcView, CrimeStat, etc., etc. for my own work but at some point it just becomes too onerous to undertake the kind of full ESDA that should be undertaken.
* An increase in the number of textbooks on methods geared towards empirical researchers in different social sciences.
* Too many to list. I am nearing retirement so the future is no longer going to be on my horizon.

* There needs to be more emphasis upon the integration of qualitative research and GIS, solid foundations of uncertainty and fuzziness theory...we're not dealing with rocks or stationary points here. These items are in great need of research(ers).
* The need for a cross-disciplinary perspective is paramount.
* The need is for more cross-disciplinary research using spatial tools and resources.
* Reliable funding sources for field research, which draws upon recent advances in spatial cognition studies, and seeks to broaden geography teaching methods in the classroom, (by incorporating large scale spatial problem-solving) and in the general society beyond the classroom (as we see in the frequent leisure-time use of GPS technology).
* I think the most important/effective way is to initiate a program promote opening new courses in social science programs, particularly in geography department, to introduce the applications (both basic and advanced) of spatial analysis in GIS environment, instead of teaching some traditional quantitative method classes and some GIS classes separately.
* Awareness and instruction at the early graduate level so that research projects can be formulated with these tools in mind.
* Funding.
* Improving the computational backgrounds for incoming students: statistics, programming, math, visualization.
* User-friendly GIS software and web-based software. Software wizards that would help non-statisticians integrate spatial analysis into research.
* Integrating informatics and computational approaches to social science research issues.
* Teaching an awareness of social implications of technology. Putting people and their everyday lives and power relations into spatial analysis will be important in the future.
* Cross-disciplinary issues.
* Need to redress poor level of doctoral training by improving programs and possibly developing strong post-doctoral programs.
* Popularize spatial analytical tools, and use them to drive demand in knowledge

Political Science, History, and Law:

* Accessibility.
* Easy to use spatial statistics computer program.
* We need an XML, web services data warehouse with a standard data format that collects data from scholars everywhere and enables others to download and readily merge spatial data sets on common keys (FIPS, country codes, etc.).
* Teach scholars how to use GIS.
* Development within strong graduate programs in History of a component that would allow interested students to develop projects with a significant spatial emphasis and the techniques they would need to push their research in this direction. This would be a particular advantage for those programs with a history of work in the sub-field of World History (e.g., University of Wisconsin-Madison) or on connections among world regions (e.g., Atlantic History).
* Lack of suitable software. Lack of understanding of the importance of space.
* Ease of conducting spatial statistical analysis in a freeware format. Import/export compatibility between useful programs or packages - R, S-PLUS, STATA, ArcView.x, and ArcGIS.x. Continued development of GeoData would be nice.
* I do not have a clear idea.
* Better software for spatial econometrics integrated with GIS.
* Ease of using software to conduct spatial data analysis, including GIS or SpaceStat. Ease of availability of spatial data from the US census and other sources. Ability to analyze spatial data using multivariate regression.

* Need for inter-operable databases.
* Education in using spatial data to TEST social science hypotheses - not simply display data.
* Introductory textbooks are thin on the ground.
* Free (or cheap) access to spatial data for academics and students (this will have long term benefits to everyone concerned).
* Well, it would be great if what Bruce Cain and the California Data warehouse at the Berkeley IGS could be replicated for many other states and workshops could be held for people who want to use such data.
* More GIS data for foreign countries, mainly non-European.
* Resource needs are software and training on its use, perhaps a journal related to planning, land use, or other policy on spatial issues.
* More and better software tools plus statistical training workshops on their use.
* Access to affordable technology, and keeping said technology affordable for the academic environment. Also, keeping spatial data free and downloadable for analysis (and not just viewing).
* More conferences so people can become exposed; more discussion of space in the standard methods texts we use, which tend to be econometric; more good applications so people become convinced of the utility of the approach; more easily usable software, and software joined to standard packages we use (such as Stata).

Sociology:

* Criminal justice practitioners and students need greater access to basic GIS training, and to spatial analysis training.
* CSISS could provide some consulting/mentoring help to the junior researchers in spatial research.
* Integrate coursework into graduate programs, making software available , and learning accessible.
* Lower cost spatial display and analysis software.
* Programs that can manage effectively space-time dimensions.
* NA.
* need for more publicly accessible georeferenced data pertaining to areas outside of North America (particularly Asia).
* Previous answered questions to this survey.
* More user-friendly software (e.g., a windows version of SpaceStat!), integrating spatial methods with multilevel modeling (e.g., hierarchical modeling).
* Give us Windows and Mac spatial analysis programs that are easy to use. I shouldn't have to create my adjacency matrices in some other format first.
* Methodologies for integration of spatially structured biological and social data.
* The development of easy to use statistical software.
* Time and resources to integrate this perspective into teaching and research.
* Real researchers believe that social justice should be approved in third world countries.
* I envision that the integration of spatial and social science research will be greatly enhanced thanks for your effort, which is much needed.
* More web based resources.
* Funding, always funding.
* Money.
* Financial cost and time of keeping up software changes.
* 1) Data Collection 2) Knowledge and expertise with software applications, including regression 3) Increased funding, which also details with barriers to entry to the field.

* Training -- spatial statistics for sociologists, and more spatially referenced data. The census just goes so far. Geographic references in the larger databases (with the usual permissions for using them) would go a very long way in encouraging and increasing spatial analyses in the social sciences.
* Linking the technology and the technicians with our everyday operations in the classroom. How to teach the statistical and research literacy so the data presentation can be questioned, challenged based on issues of validity and reliability.
* Computing algorithms and software data management, including secure storage of geocoded data.
* Translating the highly sophisticated techniques into a language accessible to large numbers of practitioners and students remains a challenge.

Anthropology and Archaeology:

* Software: learning and purchasing updated versions availability of data sets scale of data.
* Courses on Spatial Analysis Techniques and Modelling.
* Affordable GIS interfaces and support systems.
* Teaching spatial techniques not only to students, but also to practicing professionals and researchers in order to avoid the problem mentioned in A4. I think that many professionals feel that your workshops are valuable, but that they are geared towards students.
* The use of spatial statistics with caution as taught in your courses.
* I had a great deal of difficulty accessing the programs through the university. ArcView GIS and Maptitude ($1500 and $500) are too expensive for the casual user. Social science mapping does not require the depth of knowledge needed to utilize these programs. We need something less expensive and slightly less complicated.
* Broadening the user base and availability of resources for spatial social science. Funding of initiatives and research projects incorporating spatial social science.
* A centralized repository of syllabi, data set examples, and teaching exercises as well as free software tools.
* More instructive, comprehensive technical guides more varied presentation topics, representing all disciplines in attendance.
* Better access to some of the important, but more expensive forms of data necessary for doing spatial research.
* Good, comprehensive training in spatial research and training in applying spatial approaches to archaeology.
* I am note sure but maybe the NSF programs and you guys.
* For at least 15 years, fields such as sociocultural anthro and sociocultural geography have been preoccupied with theorizing the pertinence of spatial analysis to social theory. There is a disconnect between this research and theorization and the approaches to GIS that are derived from more scientifically oriented perspectives. The potential to fuse these two arenas together through cross-fertilization would be highly significant.
* I'm kind of tired of having students who know more about GIS than I do. I think that the learning curve needs to be much lower (better software) and it needs to be disseminated better to people who are no longer students. I just graduated in 1996, and will be working for what, 40 more years? I can't go back and study GIS, and I certainly can't learn it on my own. I cannot attend your workshops, and even if I did, I don't think they are long enough or fast/basic enough so that I could leave being able to do anything useful. The idea of showing people what can be done with GIS is nice, but it doesn't teach them how to do it. As I approach a tenure decision, I certainly can't take out the time necessary to teach myself. I would like to be spoon-fed. So would everyone I know. That is what we would like.
* Understanding patterns of human movement and economic development.

Economics:

* Better integration of spatial sciences (urban & regional studies, housing, transport etc. and GIS-technology)
* An easy way to use GIS data and bring any output from that into econometric software

* GIS knowledge and comprehensive software
* NSF funding for research on development of estimation methods. Software development Education and training at MA and undergraduate levels, not just Ph.D. programs.
* Data from IMF and World Bank.
* Expand your program offerings and continue to maintain an online resource on spatial applications.
* Don't know.
* Need data with geographic identifiers.
* No opinion.
* Connection to real policy problems.
* User tutorials.
* Better funding at NSF and NIH.
* 1) Better and more easily accessible spatially explicit economics data (not just data that can be seen from satellite) for broader areas of the country. 2) A comprehensive text on the application of spatial modeling and spatial statistics tools (not GIS tools or mapping tools but analytical approaches) specifically aimed at economics. This would be a synthesis of what is out there in related fields, refocused for use by economists.
* Researchers and analysts working in the area.

Population and Health:

* Definitely the development of ArcGIS, The less you have to program the better people will accept its use, especially people in social sciences.
* No comment.
* Hands-on training on applications related to items listed in A4. 1) More integrated and easier to use geostatistical applications. 2) Geographically weighted regressions. 3) Bayesian statistical modeling for local area estimations. 4) Greater access to public remote sensing imagery and easier to use software application for image analysis.
* More participation in the debate regarding the major problems of our Planet, with respect to the resources inventory and management, a benefic control of the population movement, an equitable redistribution of the land and others economic capital components, an enhancement of the physical environment hygienic, struggle against poverty. To improve the quality of the formation and the information by taking into account the diversity of the audiences (for example the gap between developed and developing countries, young and adult populations, etc.); To insure the participation of the researchers from developing countries in the programs relating to their environment; To reinforce the interdisciplinary character of the spatial research; To create a kind of united fund for research; To make the programs more effective, economic and competitive.
* I would like to see more short, affordable training opportunities for graduate students who want to use spatial analysis, but need guidance and some scheduled program to get going on it.
* -Courses-easy access to spatial data.
* As I put in the previous item, I think that a regular class should be incorporated in the basic curriculum of social sciences.
* Data management to integrate multiple layers of data.
* The ability to link multiple datasets (spatial data, quality of life, health and illness, socioeconomic status) and the promotion of spatial thinking and methodologies are the keys to encourage research and teaching in spatial social science.
* The ability to communicate analytics for policies that affect specific markets with appropriate statistical, geographical, and representational methods.

Planning and Public Policy:

* Do not understand the question..
* Following the previous point, I would like to suggest more contact between CSISS and European Universities. There are some differences in the way people see spatial social science research and teaching, and increased collaboration would shorten these different views.
* Enhanced data availability Easier data conversion utilities Continued outreach to planners/policy makers/practitioners Better integration of spatial statistic utilities with conventional statistics software.
* Let someone like myself take opportunities to learn the technique. Although I have not been selected for the past three years to attend your training, I am not giving up on applying this year.
* We need to train faculty who are unfamiliar with the capacities and potentials of spatial analysis about the broad range of applicability to all disciplines. There is a decided reluctance to embrace spatial socialscience research in traditional disciplines--even when those disciplines lend themselves to spatial research. We need training opportunities.
* Interfacing among the various types of GIS software available, and also interfacing with other statistical software such as SPSS, Stata, and the numerous other products available.
* Good maps for plotting and visually displaying the phenomenon of interest that are easily accessible and manageable.
* Economic resources, government resources.
* Better spatial regression tools... tools that incorporate both spatial and social network methods.
* Bridging the gap between theory and application.
* In the short term, the needs revolve around data and software.
* Data, also more data sharing.
* Online Visualization (2D/3D) Tools and Spatial Databases.
* Easier to use GIS software.

Computational Sciences (Statistics, Computer Science, Spatial Analysis):

* A wealth of available data, analytic software tools, teaching material.
* Pedagogically strong textbooks on spatial topics beyond first course on GIS. These books should include problem solving exercises and hands-on laboratories.
* Professional statisticians should be involved in teaching. Would you like to learn about geography from statistician? However, with a few exceptions, CSISS instructors in spatial statistics are geographers or engineers.
* Continued development of user-friendly software that implements appropriate analyses. Continued availability of relevant information. Development of relevant spatial.

Communication and Information Sciences:

* Tool integration.
* Software development as stand-alone applications and as modules in existing statistical packages. Workshops to train researchers to use those tools.
* Funding, professional development opportunities, collaboration across disciplines, communication.
* More user friendly Spatial analysis software.

Need for a research programme that investigates hybrid approaches mixing spatial computation (current DB research area) and spatial qualitative reasoning (current AI research area).

Environmental and Agricultural Studies:

* Broad scale introduction to and use of GIS in coursework.

* Seed grants.
* Professional development and follow up training Access to software and hardware.
* Access to training. Include spatial concepts explicitly into course content Network of global SSC research centers.
* 1) Simple, easy to use, free models that can be used for demonstration purposes and student projects. 2) Better training for simulation/programming based spatial modeling. 3) Better availability of spatially explicit socioeconomic data.
* Training of people in the spatial social science.
* Although there exist many conferences and workshops where ongoing research can be presented, bringing existing research teams together in order to present and discuss ongoing research and to develop joint research, like e.g. the workshop on agent-based modeling of land use would be valuable! The problem of classical workshops and conferences is just that there are just presentations with little discussion. After the presentations, nothing happens.
* Operation research / resources allocation.

Psychology:

* Technologies to aid in this type of research. Training for social scientists to use GIS.
* Available funding for equipment and software.

Arts and Architecture:

* Interoperable spatially and temporally referenced content development.
* Incentives for interdisciplinary research articulation of goodness criteria to assess the particular potentials for interdisciplinary landscape research.

A7. Please share specific examples or anecdotes of how your experience in spatial analysis has impacted your research or teaching and of how spatial perspectives have influenced developments in your discipline.

Geography:

* The adding of space to social science is a new development in many disciplines; it remains for Geography to maintain its power and interest in spatial analysis.
* Since my discipline is Geography, this is likely to be redundant on what is already evident! GIS and the advent of digital data have created new opportunities for researching both traditional themes.
* Upon returned from CSISS workshops, I dived right into Spatial Filtering Techniques etc, etc! However, some of the other things I learned require purchase of new expensive extensions (such as network analyst)!
* The chance to interact with top specialists brought fresh new perspectives to my work.
* It gave me a different angle in looking at my research issues. I also read some recommended books from the workshop. They certainly gave me new ideas on framing new research questions and formulating methodologies.
* A tool developed by our group, called SANET, has been used by many non-GIS researchers over the world.
* Being a geographer my research and teaching are of course infused with spatial perspectives. And indeed one of my goals in my teaching and research is to demonstrate to scholars and students in other disciplines what spatial perspectives can bring to a better understanding of social, political, cultural and economic processes as well as for problem solving.

* After compiling extensive databases of indicators, geocoding them, aggregating them to similar geographies, and finally allowing their overlay with GIS tools -- am disappointed by how little these resources are used. Suspect that it is not only the seeming complexity of existing GIS tools, desktop and web-based, but also the lack of semantic interoperability between datasets that has prevented meaningful spatial analysis of multiple overlaid variables.
* Exploring partial optimization problems and their solution algorithms, developing GIS based local crime data mapping and analysis.
* Again, I'm in geography, so spatial analysis is pretty much *essential* to my research.
* I have been using the techniques I learned from the workshop to analyze two sets of data. I teach these techniques in one of the graduate classes I teach. The students really like to learn them and all of them have applied the techniques in their theses or dissertations.
* Usually by finding out how other researchers make (erroneous) assumptions about standard spatial data analysis techniques, often because the software doesn't challenge them.
* Spatial analysis has allowed me to test long-held assumptions that are the basis of huge policy and land management decisions... and they are wrong.
* I am changing the way we teach our introductory GIS and quantitative methods courses in geography.
* Spatial analysis is driving management decisions related to fisheries closures especially in respect to socioeconomic impacts and protected species interactions.
* We are now using Bayesian analysis to analyze high-resolution satellite imagery.
* My current research deals with dynamic modelling of urban land use change. So, besides spatial statistical methods related to modelling itself, I am as well concerned with spatial analysis techniques properly speaking for the pre-processing of my models input data, like Kernel´s point and area density estimators, etc.
* My work on crime-dependency analysis, multiple-ethnicity segregation, spatial interaction model for air pollution exposure; I am also organizing a session on point pattern analysis in GIS at AAG meeting.
* CSISS has fostered collaborations in this department -- especially on the topic of accessibility, for which it turns out that we have many varied perspectives.
* -More generally, I often present at political science conferences and I find that the geographic perspective (esp. something as simple as a *map*) is warmly received; arguing, as I often do, that social scientists should look with more effort for evidence of parameter drift, parameter instability, parameter variance (call it what you will) instead of naively accepting global parameters often leads to lively discussion.
* As a geographer, the growing recognition of the importance of space by colleagues in economics, religious studies and anthropology have lead to collaborative projects.
* Illness and the nearness of retirement have truncated plans I had for using more GIS in my teaching and research.
* It's what I can't do and am having trouble with that intrigues me the most. Mainly uncertainty of spatial data. In social science...or heck...in geophysical research, we are constantly dealing with uncertainty or fuzziness of location.
* My experience has enabled me to appreciate the benefits of spatial analysis. It has great benefits that extend beyond the discipline of geography.
* My research focuses on cognitive mapping abilities of children and the extent to which orienteering (wayfinding with a map) influences these abilities. My objective is to encourage the use of large-scale experiential learning activities and build upon the existing spatial skills of children. Such experiences and skills can, I believe, greatly enhance understanding of abstract geographic concepts and strengthen interpretation of cartographic information. I have extensive experience teaching orienteering and land navigation to children and adults. It is an activity that provides immediate feedback about the learner's ability to integrate 3-dimensional reality with 2-dimensional representations of reality. This ability lies at the heart of geographic/spatial thinking. I have videotape of 4th graders solving such problems and learning to really see themselves in spatial relationship to the environment through the use of a map. I am just beginning my teaching/research career, but I believe that such spatial problem-solving in large scale (local, small area) environments has positive implications for how learners come to envision spatial relationships at the smaller (regional, global) scales.

* Specifically, my experiences at the CSISS summer workshop at OSU has helped further my thinking in terms of how to incorporate issues of accessibility into my dissertation work.
* I have incorporated issues on gender on resource use among natural resource dependent communities.
* Inter-disciplinary contacts with political science, sociology, economics, and anthropology and the recognition by increasing numbers in these disciplines of the importance of spatial analysis.
* You're asking for a pretty big answer. My teaching and research are centered in the area of spatial analysis. The impact of spatial perspectives on GIS and cartography would take many pages to describe.
* I have used spatial analysis discussion and exercises in teaching a course that involves students from different social science departments: anthropology/archaeology, sociology, political science, planning, MIS, marketing, history.
* I am working with staff of the Centers for Disease Control (CDC) and the National Cancer Institute (NCI) to develop a special issue of the *American Journal of Preventive Medicine* on the subject of GIS and Prostate Cancer.
* Mostly through publications.

Political Science, History, and Law:

* Particularly enjoyed history of cartography discipline itself, noting how modern applications differ -- including tremendous benefits as well as some handicaps. Also enjoyed exposure to practical applications.
* Analyses of aggregate data in political science studies on social influence in electoral behavior research.
* I have constructively raised eyebrows in a number of settings just by pointing out that spatial autocorrelation could be a problem in various models, and by describing the relatively simple spatial lag approach. Whether this awareness is growing significantly in political science is something I will have to look for in coming months.
* Spatial analysis has allowed me to stress, in both research and teaching, the ways that connections between locations have affected historical processes within them, and it has permitted me to treat the complexity of these processes within a much richer multivariate and multidimensional approach than was possible earlier. I am referring here specifically to the use of Geographic Information Systems to combine layers of distinct data types for a visualization of these processes. During the fall semester, 2002, I was able to introduce into my undergraduate course on Iberian empires in the first global age (1400-1800) a project that required students to develop spatial data sets expressing the routes that connected particular locations they selected with other locations relevant to the history of their chosen ones. It worked well, and my article about the project is now in press.
* It has led to my participation in the ECPR workshop this year.
* Interdependence among citizens is now clearly recognized as an important aspect of social life and is now being treated seriously in theory and empirical research.
* Is slowly leading a re-examination of some old ideas and beliefs that were never properly tested.
* Countries are not independent units, and we should take into account the fact that (neighboring) countries influence each other. Diffusion of conflict, democracy, and economic development. Spatial analysis is useful to detect the patterns.
* My most recent paper analyzed whether various forms of government-assisted housing were associated with higher versus lower rates of political participation net of the various well-established factors (age, education, citizenship, property ownership, income, etc.).
* My discipline has not really been affected. Personally, my research on environmental justice has convinced me that a spatial analysis approach is essential to understanding even what is happened, let alone, what policies could change events.
* Published new work using these tools. And more of this work is gradually breaking into the mainstream journals.
* I am teaching a course right now that would not have occurred without my participation in the CSISS workshops. Teaching a course in the use of GIS is pretty straightforward; teaching a course in spatial analysis is far more challenging, but the intellectual rewards are far greater.

* I am doing a paper with my colleague Kristian Gleditsch, a student of Mike Ward's, on thinking about different ways of measuring.
* My own work has to do with spatial mappings of vote choices in the United Nations General Assembly. We are working to develop a computer program (UNVoteview) that allows users to construct both ideological and geographical maps of vote divisions throughout the history of the UNGA. The program will interface with Arcview. We expect a preliminary launch in the Fall of 2003. I presented on this topic to a mapping conference at Stanford (CISAC) last Spring.
* I believe spatial analysis has helped historians trace the spread and influence of cultural trends. Conclusions on influence no longer have to be based in mere generalizations.

Sociology:

* I learned to use GIS as a crime analyst at the Dallas Police Department. I combined this knowledge with my growing interest in spatial analysis and social ecology to design and complete my Ph.D. dissertation. I am continuing to use this knowledge and training in research and publication (and in teaching).
* I teach crime mapping at my college. My background in environmental criminology (contemporary criminological thinking) has helped me with spatial research. In my field, spatial research is influenced by place-based research, problem oriented policing, situational crime prevention, crime prevention through environmental design, defensible space, neighborhood prevention, etc.
* I have not used spatial analysis. I would very much like to learn and use it in my own research. Some of the most advanced researchers in my field are attempting to integrate it into their own work.
* I have integrated research by economic geographers into my undergraduate sociology courses.
* I am currently incorporating spatial analysis techniques in my undergraduate courses to expose students to the importance of paying attention to spatial qualities in urban inequality.
* I have included a alternative method (for sociologists) for aggregating social and economic information into my dissertation which is currently receiving a fair amount of attention. I have been invited to give a talk on this alternative method at a national conference in Aug. CSSIS has been fundamental in developing this interest/perspective.
* Previous answered questions to this survey.
* Measurement of how and where the geopolitical line between cosmos and chaos or friend and foe influences security perceptions.
* I've been exposed to several projects that attempt to look for spatial evidence of social interactions across different neighborhoods or land parcels. One way in which this is done is to look for an interaction in which Neighborhood A influences Neighborhood B which influences Neighborhood C. I've recently applied a similar model to study correlated behaviors over three successive defined time periods. I've also found myself thinking more about the interaction of social and spatial factors, although I haven't done a lot of work on this yet. I've begun to look for spatial factors that potentially create researchable situations--for instance, I recently wrote an article modeling interactions between two individuals who were living in a group home together--and I've begun to think about ways in which spatial configurations can control for confounding variables.
* I have personally benefited immensely from exploring spatial analysis and have carved out a nice niche for myself within my discipline. I am continually amazed at how interest in spatial analysis continues to grow.
* Few in my field but I would like to see applications of statistical models to study the so-called contagion effect of concentration of urban poverty and how neighborhoods affect socioeconomic inequality.
* People should be considered within their own social situation.
* I have my intro to sociology classes look at some of the maps on the web to spur their interest in thinking spatially (i.e., urban sprawl & pollution). I've helped (a little) with some descriptive mapping of housing types and service agencies

in the city of Chicago. Long term, I hope to do more with spatial analysis--at this point, I'm still very much a neophyte, and it takes a while to incorporate a new perspective in a research agenda.

* GIS is very important in my research and I have already applied part of what I learned in 2001 in several of my research projects, which include some presentations at the Joint Statistical Meetings, and the American Society of Criminology, etc.
* Used spatial analysis and GIS in my dissertation research.
* I use GIS and spatial thinking to create precise pollution proximity indicators and facilitate spatial autoregressive procedures and I use maps to test spatial hypotheses and better understand the spatial relationships between social groups and social goods and ills.
* The visualization methods grounded in cartographic conventions that I studied in last year's workshop have greatly improved the quality of maps I produce for law enforcement officials - I'm able to produce more data-rich maps that can be quickly reproduced and disseminated throughout an agency and in different formats.
* Specifically in health-related issues from a sociological standpoint.
* I do work on geographic distribution of healthcare and social service resources. In working with providers, I have continued to feel challenged by what they perceive as insurmountable barriers to using GIS and spatial analysis.
* I use it regularly in community research and help communities.
* Graduate course in migration – interdisciplinary environmental research integrating human and natural systems data over space residential segregation funding initiatives at major government agencies.
* I have been able to link demographic change and social struggle but because of the lack of access to software and assistance, I simply am forced to use stickers and photocopied maps. A bit frustrating!

Anthropology and Archaeology:

* Not yet. If I attend your weeklong conference this May that will of course change dramatically.
* In my discip line there has been a huge reaction against the use of computers and statistics in archaeology. There are also many who do not believe in the usefulness of GIS is archaeology - it is merely for pretty maps they say. However, for my current research on the settlement patterns of Roman Britain it has been an invaluable tool for analyzing the distribution of settlements and artifacts, visualizing the landscape and providing contextual information for settlements (placing them within the environment). It has also been valuable for predictive modeling. In the age of post-processual archaeology, I say GIS is an incredibly valuable tool for archaeology, as long as one is aware of the limitations of archaeological data and various analysis techniques.
* Spatial studies using GIS are relatively new and fairly contested in my discipline. However, through your training as well as other university training, I feel that it is indispensable for my proposed dissertation research. GIS has the potential to aid spatial/temporal research, particularly in the hypothesis building and testing stages of analysis.
* I have used cluster analysis to look at the clustering of sites within river valleys in Mesoamerica. I have used the information from the summer course to teach students the basics of spatial patterning analysis in my courses in archaeology and sustainable international development.
* I'm new to spatial analysis but it is highly relevant to my work documenting changes in subsistence use areas in Alaska.
* I am presenting at the SfAA conference in March, talking about how to use GIS and spatial analysis in anthropology, looking specifically at levels of pollutants in the air as evidence of environmental injustice.
* My knowledge and ability to work in ArcView GIS has greatly improved since attendance at the workshop. This skill will be directly made use of in my Ph.D. research, as well as my future academic career.
* I've mapped monthly landings by port to show the patterns that existed prior to area closures and am using that to determine impacts of the closures (along with other info). It shows that effects were more concentrated for one community, and that consideration of these effects is important.
* Space has always been an important part of archaeological research. Thus, spatial technologies, which help in the analysis of spatial aspects of archaeological data, have always been important. Technologies such as GIS, and tools

such as GPS receivers have made it much easier to quantify and understand the way in which space impacts society. Although space is also important in other subfields of anthropology (behaviors take place in space and space can affect behavior), the recent developments in spatial technologies have hade little impact. Recently, however, more cultural anthropologists have been adopting these technologies. As a result, more university positions have included a desire for applicants with research foci involving spatial technologies such as GIS.

* My colleague Andreas Dafinger has extensively worked with spatial analysis in his dissertation research and also in his present postdoctoral fieldwork. That is how I got interested in it.
* It really isn't influencing it much yet. It is only starting. Some modeling projects are underway, but little is being done that I know about.
* Spatial analysis allows archaeologists not only to make faster maps, but it allows complex spatial analyses to be completed when previously archaeologists did not have the background in spatial statistics to complete such analyses.
* Sorry but deadlines prevent me from answering this today.
* I have been teaching and researching about urban culture and social space for quite a few years now (as a sociocultural anthropologist). I was curious as to whether GIS would offer me additional useful tools for my projects, so I took a course during a sabbatical from teaching. I am very enthusiastic about learning to incorporate GIS into my work as a result. It's complicated enough to learn GIS that I've not had adequate time to pursue it to the point that I can really use it without having to re-learn how to do it each time. I hope to redress my frustrations by applying for a grant to support teaching release time. My interdisciplinary social sciences program (undergrad) offers a GIS course, but it is in no other way incorporated into the curriculum through the research and teaching of other faculty members, which I regard as a problem that ought to be amended.
* I'm a landscape archaeologist and almost everything I do is spatial.
* I've learned that space and place DO matter, particularly with migration flows between Mexico and the U.S. Not just the flow from Mexico to the U.S. but for regional patterns of movement and for social inequalities that define that movement.

Economics:

* No examples.
* I have been awarded funding from the National Marine Fisheries Service for research into spatial dependence in the effects of habitat restoration.
* Spatial spillover effect.
* Spatial estimation issues are beginning to have an impact in my discipline, but these are still considered peripheral to the point that it is difficult to justify teaching a course focusing on these issues in anything but a Ph.D. program.
* I have made use of ArcView for the first time a research project to estimate a contagion model based on physical proximity.
* No.
* As a result of techniques learned from CSISS courses, The techniques that I have learned in these workshops has resulted in three research papers currently under review at the with three research journals in marketing and real estate.
* Sorry, none.
* A full appreciation of space (and history) erodes ones faith in generalization and stationary. Most phenomena represent small sample problems. Most phenomena are emergent so measures of central tendency are sometimes worse than useless. Emphasis has shifted to examination of entire distributions, the construction of classes and typologies and to intense qualitative analysis of emergent cases. I can't say that these approaches are developing within the discipline, however.
* Many geomeasures have been introduced as elements in analysis of microdata.

* Spatial analysis has become the focus of 60% of my research on land use. Since it is a new area in economics, it is easy to find funding.
* Analyzing Inequality and Poverty in South Asia across regions, sub regions, villages.

Population and Health:

* I am currently working on student attrition and using the spatial analysis will have stronger implications for social policy.
* No comment.
* The phenomenon of the crypto desertification I had to report on to the United Nations as indicated above, was for me a difficult subject, since I had no at that time any notion of spatial analysis to geographically overview the issue. I did learn by myself and to contact People to the Intelsat program in Kinshasa, to be able to finalize my report. This is way I consider that skills in spatial analysis are necessary for a demographer.
* I'm looking at the epidemiology of asthma in a developing population - and the kinds of variations in risk factors that characterize what has been glossed as a rural-urban dichotomy.
* - I worked with a dataset that had been extensively analyzed with linear models. The results were very informative, although some models were highly unstable, and many variables expected to have strong effects were never significant.
* My public health research has incorporated spatial analysis for targeting disease hotspots, identifying trends in disease incidence, and for assisting with resource allocation.
* Provided opportunities for colleagues to consider this area in their (success) grant applications.
* Spatial perspectives are most pertinent for examining access to health care and area variations in the use of health services. I have incorporated the perspectives in some of my research, and have tried to encourage graduate students to carry out research in this field. Currently, I have a graduate student investigating the locations of pharmacy internship rotation sites to understand whether the distribution of these sites meet the requirement to provide culturally competent training to our professional students.
* The notion that causative exposures occur at specific space/time coordinates until very recently has been lacking among epidemiologists and health scientists who tend to have a clinical tradition. As applications of GIScience in health analysis have expanded, institutions are 'finally' adding spatial training to their public health curricula. But this is slow going, and the training materials and resources from CSISS serve a critical need.

Planning and Public Policy:

* My main research interest deals with the use of spatial information technology in urban and regional planning. My Ph.D. (dissertation defense forthcoming) is on this topic. I'm introducing the discipline in my teaching and professional activity, although often appropriate institutional settings are missing.
* It has been of some importance for me to be knowledgeable about spatial analysis but neither the Dean nor many others in my dept. know what to do with the skills/methods. I am not given the flexibility or time to produce meaningful results (i.e., have not yet been given the opportunity to teach a full course in GIS/spatial analysis – the upfront cost is too great).
* I have not a chance to learn about the spatial analysis.
* We are in the process of establishing a GIS minor at the university. Survey results documented that 86% of the demand for the new minor did not come from Geography, Environmental Studies, etc., but from Public Administration students who are approaching the employment market and recognize the need for that skill base.
* I did a 5-year study of traffic crashes and speed enforcement to determine the nature of the relationship in Stata. I attempted to replicate it in ESRI's Arcview, but was unable to work the data into the mapping software. I was forced to map one year's data in lieu of the panel study. I intend to re-explore this topic for my dissertation, but will need additional training in GIS to do so.

* The awareness of spatial limitations in my analysis on conflict has forced me to disaggregate the level of generalizations in many cases, from the world to and between regions.
* Sardinia is a big island and it is a lagging behind region (objective 1 of European community funds). The spatial analysis helps the regional government to point out the area with a lagging behind development. That helps to grow and to overcome this situation. The next European map will depict the Sardinia Island as a good progress area.
* Cluster and pattern analysis has allowed my organization to think out of the box when it comes to urban typologies/classification. With the use of advanced remote sensing techniques and spatial analysis/statistics, we hope to go beyond the typical land-cover/land-use classification and incorporate socio-economic factors in characterizing and comparing urban regions.
* Spatial analysis has allowed me to uncover important, but often overlooked spatial variation in social welfare programs outcomes and resources. In the past, policy analysts have sought large nationally representative surveys, yet today we see more policy research taking spatial variation into account as it draws samples and conducts analyses.
* Using GIS for spatial analysis in my research projects helped me looking at data geographically and often it suggested new insights and explanations that these connections are vital to understand and manage social and spatial problems.
* I set up an international seminar series with a strong geo-economics theme I have been invited to give seminars in mainstream economics departments who have become increasingly interested in the spatial dimension.
* Spatial perspectives have helped me understand how to measure the impacts of public and assisted housing programs that seek to disperse the poor. I've learned how to measure access in a variety of ways and many different ways to think about distance.
* My past experiences have made it easier to illustrate how to better consider various social dilemmas in a manner not solely associated with interpreting a regression coefficient, e.g. crime outcomes and the visualization of enforcement patterns.

Computational Sciences (Statistics, Computer Science, Spatial Analysis):

* For us, it is the visual effect of showing conclusions on a map that is most important. We have experienced this several times with potential customers, who initially were not much impressed without the visual clue.
* In the 1980s, relational databases (RDBMS) were inadequate for supporting spatial applications. This realization lead to evolution of RDBMS to object-relational databases (ORDBMS) in the 1990s. Similar evolution of data mining techniques is happening currently to handle special properties (e.g. auto-correlation, continuity) of spatial datasets and patterns.
* Permanent misusing of spatial statistics led me to the idea to write a book on spatial statistics.
* Have been a engine for a burgeoning of spatial/temporal statistical analyses.

Communication and Information Sciences:

* Software tools visualizing networks over time.
* I have not been able to fully infuse spatial analysis into my research. I am just beginning in my field in terms of research, and plan to definitely incorporate this soon. What has impacted me is the whole new way of thinking about and perceiving the world and its' data.
* My experience in spatial analysis (in particular, spatial data mining) has been the starting point of my Ph.D. thesis. I have generalized solutions for spatial data types to solutions for the most currently adopted data model for spatial data types, i.e., object-relational data model. This generalization step has lead me to investigate issues of data mining in the case of object-relational representation for both data and patterns. Spatial data has remained the reference case to illustrate my ideas.

Environmental and Agricultural Sciences:

* My advisor thought I was nuts to go off to a spatial analysis workshop last summer, however now we are beginning to write grants that will require collection of GIS data and spatial analysis to inform more specific research questions for my dissertation. She's been converted!
* It has given me headaches trying to explain it to dunderheads.
* Enhancement through superior visualization capabilities. Analysis of complex systems and interactions.
* It is known that animals exhibit spatial behavior and preferences for the landscape. It is not hard to extend this thinking to humans and how their preferences and attitudes to environmental objects can affect how those objects are managed and used.
* To follow my studies doing the thesis over this topic.
* In my graduate field (environmental and resource economics), there is a growing interest in spatial methodologies, but very little willingness to move beyond the traditional techniques used in the discipline (deductive mathematical modeling and econometric analysis). Those scholars who are perceived as having skills in these areas are in high demand. I do spatial modeling and have skills in these areas, but my main research focus falls in areas considered less acceptable for economics in general. As a result, I've developed more of an interdisciplinary identity. The support of CSISS has been invaluable, because the organization and affiliated faculty have the reputation and credibility needed to convince outsiders that my approach to research merits some serious consideration. At this point my research spans at least three disciplines. Within economics, spatial perspectives have led to better modeling of human/environment interaction, better understanding of spatial dynamics, and at least some thinking about the relationships between microelements and macro outcomes. Within complexity theory and agent-based modeling, spatial models have led to more applied, empirically driven applications of ABM, some of which have received substantial attention by other research communities. Within geography, agent-based modeling appears to offer some exciting opportunities to address cross-level or cross-scale relationships from a modeling perspective, which could potentially complement the wealth of descriptive analysis done on scale issues.
* Currently using spatial analysis in depicting the overgrazing of communal grazing areas in our country.
* Spatial information is being used as a blackboard in interdisciplinary studies that address environment issues such as habitat preservation, urban sprawl, environmental quality, and quality of life.

Psychology:

* Within developmental psychology (my discipline), the focus on spatial analysis is rare, but the growing numbers of people involved in activity or cultural historical theory are increasingly attending to the material environment. My program works in close quarters to an environmental psychology program, thus there is increasing crossover, but it is still quite limited and isolated from other areas of social science involved in spatial perspectives.
* Maps communicate information clearly and quickly thus assisting in the understanding of complex concepts.

Arts and Architecture:

* Modeling Southeast Asia data helpful in promoting further digital resource development.

CSISS Survey of Program Applicants and Participants

Survey respondents received an email (as illustrated below), informing them about the survey and giving them an ID code to enter the web site of the UCSB Survey research Center.

From: Center for Spatially Integrated Social Science
<csiss_survey@lists.survey.ucsb.edu>
Reply-To: csiss_survey@lists.survey.ucsb.edu
To: jwadams@gwm.sc.edu
Subject: Please respond to the CSISS Survey!

Dear _____,

The Center for Spatially Integrated Social Science (an NSF-funded program to develop research infrastructure in the social sciences) is seeking to document outcomes of its programs and to trace trends in the development of spatial thinking in the social sciences. As a prior applicant or participant to one or more of our events your feedback is extremely important to us and will be used to improve the quality and participation of our programs.

Please go to:
http://research.survey.ucsb.edu/csiss/
and use your random User Id code to log on to the survey.

Your random User Id is: 26956

The data collected will be used to assess how CSISS might better meet the needs of those interested in applying spatial perspectives in the social sciences. It will complement measures relating to publications, grant agency funding awards, and other indicators of scientific activity.

Results from the survey will be posted in summary form at:
http://www.csiss.org/survey/ in April 2003.

We appreciate your taking time to assist in this effort.

Sincerely,
Michael Goodchild, PI and Director
Don Janelle, Program Director

Log In | Reset

The Center for Spatially Integrated Social Science (an NSF supported program to develop research infrastructure in the social sciences) seeks to document outcomes of its programs and to trace trends in the development of spatial thinking in the social sciences. This survey is directed to prior applicants and to participants in CSISS events. The data collected will be used to assess how CSISS might better meet the needs of those interested in applying spatial perspectives in the social sciences. It will complement measures relating to publications, grant agency funding awards, and other indicators of scientific activity. Results from the survey will be posted in summary form at http://www.csiss.org/survey/ in April 2003.

We appreciate your taking time to assist in this effort.

Problems logging in? Click here!

Questions about your rights when participating in research? Click here!

CSISS Survey of Program Applicants and Participants

F1. Have you ever participated in at least one of the CSISS workshops, specialist meetings, or conference events? Click here for a list of programs we have offered over the last three years.

- ☐ Yes, I have participated
- ☐ No, I haven't had a chance to participate

(***Note**: Applications for programs have exceeded the positions available. CSISS regrets that it has not been able to meet the demands of all applicants. These survey results will help to identify the extent of the demand and to find alternate approaches to serving those interested in spatial social science.)*

NP1. **If you have not participated in CSISS programs**, please check the response that matches your situation:

- ☐ I was not offered a position in a CSISS workshop or specialist meeting
- ☐ I was accepted but had to decline the offer to participate in a CSISS workshop or meeting.
- ☐ Other, please specify

NP2. I applied for a position in a CSISS Summer Workshop in the year [please check all that apply].

- ☐ 2000
- ☐ 2001
- ☐ 2002

Participation in CSISS programs and activities.

P1. What CSISS activities have you participated in? [check all that apply by type and year].

	2000	2001	2002
Summer Workshop	☐	☐	☐
Conference Workshop or Session	☐	☐	☐
Specialist Meeting in Santa Barbara	☐	☐	☐
Other *(please specify below in question P1O)*	☐	☐	☐

P1O. Please list below other CSISS activities you have participated in (if any):

P2. Please indicate how much you agree or disagree with the following statements

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	N/A
My CSISS experience has had positive impacts on my research.	☐	☐	☐	☐	☐	☐
My CSISS experience has had positive impacts on my teaching.	☐	☐	☐	☐	☐	☐
The intellectual direction of my research and/or teaching has changed based on my CSISS experience.	☐	☐	☐	☐	☐	☐

Please tell us something about yourself, so that we can better structure future CSISS programs and activities.

A1. Please indicate how much you agree or disagree with the following statements

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	N/A
I am a leader in research applications of spatial thinking and analysis in my discipline.	☐	☐	☐	☐	☐	☐
I currently make extensive use of spatial analysis in my research or teaching.	☐	☐	☐	☐	☐	☐
I expect spatial perspectives to play	☐	☐	☐	☐	☐	☐

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	N/A
a more important role in my future research and/or teaching.						
There has been increasing evidence of spatial thinking and analysis in my discipline over the past decade.	☐	☐	☐	☐	☐	☐
Funding resources are adequate for spatial research in my discipline.	☐	☐	☐	☐	☐	☐
I make frequent use of CSISS online resources (www.csiss.org) in my research/teaching.	☐	☐	☐	☐	☐	☐

A2. I have recommended CSISS programs and web resources to [check all that apply]:

- ☐ Students
- ☐ Colleagues
- ☐ Advisees
- ☐ Professors
- ☐ Advisors
- ☐ My class
- ☐ Staff
- ☐ Other (please specify): [ ]

A3. Please list a few of the most important developments or initiatives that have influenced the growth of spatial perspectives in your discipline (list specific conferences, workshops, publications, funding programs, web resources, etc.) over the **last decade**.

[ ]

A4. What new developments or initiatives are forthcoming that could help or hinder the growth of spatial perspectives in your discipline over the **next decade**?

A5. Please identify (list) any programmatic or resource needs for spatial social science research and teaching in the near future that are not likely to be met adequately by CSISS or by other institutions.

A6. Please identify (list) what you consider to be the most significant programmatic or resource needs for spatial social science research and teaching for the next decade.

A7. Please share specific examples or anecdotes of how your experience in spatial analysis has impacted your research or teaching and of how spatial perspectives have influenced developments in your discipline.

Participant Background:

B1. My main discipline is:

Discipline

B2. I am currently a

- Graduate Student
- PhD Candidate
- Post-Doctorate
- Untenured Academic
- Tenured Academic
- Other (please specify)

B3. Gender?

Male **Female**

B4. Part of the purpose of this survey is to compile a report. In the report, we will summarize the survey information. However, we might be interested in directly quoting some of the responses you have given us today. **Would you like to give CSISS permission to quote your statements in previous sections of the questionnaire?**

Yes **No, I'd rather not be quoted**

B5. We are also planning to contact a small number of respondents for an informal in-depth interview about some of the themes raised by their responses. **Does CSISS have permission to contact you?**

Yes **No, I'd rather not be contacted**

B6. If you responded yes to either one of the previous questions, please provide us with the necessary contact information:

Name:

Institutional affiliation:

Email address: your@email.com

Thank you for your time!

Submit Survey