Spatial Perspectives on Analysis for Curriculum Enhancement

NSF DUE 0231263

NSF 02-043 CCLI National Dissemination

Annual Report
October 2004 – September 2005

Compiled by

Donald G. Janelle
Principal Investigator

Center for Spatially Integrated Social Science

University of California, Santa Barbara
3510 Phelps Hall
Santa Barbara CA 93106-4060

Office: (805) 893-8224
Fax: (805) 893-8617
Email: csiss@csiss.org.
www.csiss.org/SPACE

October 2005

Table of Contents

NSF Proposal 0231263: NSF 02-043 CCLI National Dissemination

Annual Report for October 2004 to September 2005

Activities: Year 2

SPACE seeks to achieve systemic change within undergraduate education in the social sciences. Current funding from NSF is for three years (October 2003 through September 2006). Our approach is based on the value of spatial thinking, and associated technologies (geographic information systems, tools for spatial analysis), as the basis for greater integration among the social science disciplines, greater motivation for students, greater relevance to societal problems, greater integration of technology into undergraduate instruction, and greater employment prospects for graduates. In this program, knowledge in spatial analysis is linked with CCLI objectives for national dissemination of curricula and assessment resources.

The program is centered on a series of professional development workshops, with extensive follow-on activities; and features additional programs designed to leverage these workshops, to achieve high rates of participation among traditionally under-represented groups, and to bridge the gap between research and teaching in the social sciences. SPACE is organized by a consortium led by the University of California, Santa Barbara (Project PI, Donald Janelle; co-PIs, Michael Goodchild and Richard Appelbaum). Other participants in the consortium, under contract to UCSB, include The Ohio State University (PI, Mei-Po Kwan), and the University Consortium for Geographic Information Science (PI, Arthur Getis).

SPACE focuses primarily on National Education Workshops to provide undergraduate instructors with basic skills in GIS and spatial analysis, and introduce them to the latest techniques, software, and learning resources. SPACE is also committed to organizing sessions at major conferences to provide instructors with basic introductions to using spatial technologies in the classroom, to maintain engagement with participants in the national workshops, and to reach wider audiences than the workshops. The project includes a website (www.csiss.org/SPACE) that provides an on-line clearinghouse for lab exercises, data sets, test items, examples of syllabi, and assessment instruments.

SUMMARY OF PRIMARY ACTIVITIES IN YEAR 2:

In year two (Oct 2004 – Sept 2005), the project team carried out the following activities to achieve program implementation:

- The Annual Planning Meeting at UCSB, December 2004, provided an opportunity to assess year-one work workshop results and to make adjustments in the program for 2005. This provided an opportunity to share ideas from the different workshop experiences and to acquaint the new UCGIS team from San Francisco State University with the objectives of SPACE.
- The Website (www.csiss.org/SPACE) was enhanced with resources (syllabi, exercises, data, assessment instruments, discipline resources) for workshop participants and for site visitors interested in implementing spatial analysis perspectives to undergraduate education. Site usage has increased significantly over the previous year – by a factor of 2.6.
- The workshop-advertising program included the production and distribution of fliers, and the preparation of a new brochure describing the SPACE program and its resources to help enable social science instructors to introduce spatial analysis in their undergraduate teaching.
- Following results from the Planning Meeting assessment, the Web administered application and adjudication procedures, information resources for prospective participants, and the workshop Entry and Exit Surveys were revised for 2005.
- A Follow-up Survey of 2004 workshop participants was design and implemented -- see results "Findings" section.
- The UCGIS and San Diego State University coordinators of the 2004 workshop presented a panel session at the Spring Assembly of UCGIS in Washington DC (involving 2004 workshop participants) and provided presentations for the SPACE website.
- The SPACE Educational Development incentive awards program was introduced and advertised to 2004 workshop participants. Applications were evaluated, 12 awards were made, and the results were used to produce a new section of the website – illustrating how SPACE participants enhanced their courses and educational programs and how they used the awards to further the development of spatial analysis in their own training and for their courses and institutions.
- Significant efforts were made to encourage a greater number of applicants from designated minorities and from minority serving institutions – as a result, 25 percent of all participants were of minority status in 2005 workshops.
- Three 6-day-long workshops were organized and hosted at UCSB, OSU, and SFSU (for UCGIS).
- The SPACE ACCESS program (Academic Conference Courses to Enhance Social Science) / see http://www.csiss.org/SPACE/workshops/access.php was initiated, resulting in four conference-based sessions/panels/short workshops for the following associations: Society for American Archaeology, Association of Collegiate Schools of Planning, the National Technology and Social Science Conference, and the Association of Social and Behavioral Scientists.
- The PI, with cooperation from workshop coordinators and the Educational Development Coordinator (Fiona Goodchild), completed the Annual Report to NSF for submission in late September 2005.
- The PI gave presentations on the SPACE program to the Social Science History Association, and the annual Crime Mapping Research Conference.

SPACE Planning Meeting

The Planning Meeting in Santa Barbara (December 10 - 11, 2004) was a key event in directing informed changes in the program in year two. It began with an **Evaluation Summary on Pedagogic Issues** (Fiona Goodchild and Stacy Rebich) stemming from the first year of workshops. A panel of 2004 workshop coordinators and workshop participants discussed **Participant Experiences and the Translation to Undergraduate Teaching**, followed by breakout-group discussions on the following questions:

- How can materials and concepts presented in workshops be reconciled with what participants can do in their undergraduate courses?
- How can workshops be structured to illustrate the benefits of alternative teaching formats that participants might use to enhance the learning of their undergraduate students?
- How can workshops encourage and equip participants to adopt learning assessment practices with their students?
- How can workshops engage participants in useful strategies for finding and manipulating relevant data for use in their undergraduate teaching?
- What strategies might be used to encourage greater use of SPACE website resources by workshop participants and their students?

Additional breakout sessions considered operational questions to help enhance the workshop experience for participants, including the following:

- What steps can be taken to lessen the variation in participant backgrounds for each workshop (e.g., assigned readings prior to the workshop, pre-workshop tutorials on-line, or an extra day of on-site instruction on the day before the workshop starts)?
- How can/should workshop instructional teams share classroom/lab exercises and related data sets? (E.g., a CD or web resource that each workshop coordinator could contribute to – for distribution to all workshop participants, including those from 2004 and 2005)?
- How should the 2005 SPACE workshops at UCSB, OSU, and SFSU be differentiated from one another (by level of participant background, technical themes, discipline orientation, and duration)?
- What is the appropriate balance between technical content and educational development and how might this vary by workshops?

Reports on Related Programs and Issues:

- Don Cartwright, How to Create and Monitor Mentoring Programs
- Eric Fournier, An Overview of the NITLE (National Institute for Technology and Liberal Education) GIS Initiative (see http://gis.nitle.org/)
- Nina Lam, the UCGIS Model GIS Curricula (see http://ucgis.org/priorities/education/strawmanreport.htm)
- Judith Van Der Elst, A GIS Story at the University of New Mexico
- Richard LeGates, NSF-supported Initiative at SFSU to Develop Curriculum Materials on Spatial Analysis for Undergraduate Social Science Courses

Technical Session:

- Using GeoDa (exploratory spatial data analysis) in SPACE Workshops and in Undergraduate Education (Stuart Sweeney, Christine Jocoy)
- Using FlowMapper in SPACE Workshops and in Undergraduate Education, David Padgett; Comments: Waldo Tobler

Implementing Professional Development within *SPACE* – possibilities and examples
- Strategies and Resources for Learning Assessment, F Goodchild, S Rebich
- Accommodating Expert and Novice Learners, K Plank

These sessions were followed by discussions on the implementation of the SPACE ACCESS and Awards program and by a half-day of discussion on the specific plan for each of the 2005 SPACE workshops.

ADVERTISING THE PROGRAM AND SOLICITING PARTICIPANTS:

The advertising plan for year 2 was based on improving the level of information provided to likely applicants on the website, the distribution of fliers (approximately 1,000 distributed through departments, academic associations, and meetings). List-severs and email listings were used for wide spread exposure.

Advertising to tribal colleges and universities, historically Black colleges and universities, and Hispanic serving institutions included fliers to academic administrators. However, we also made direct contact with representatives from some of these institutions, with a special focus on HBCU institutions. Dr. David Padgett (participant at the 2004 UCSB workshop and at the planning meeting) provided special support for this initiative.

A special brochure on SPACE was prepared and printed for distribution at conferences where SPACE workshop participants give presentations on their pedagogic achievements.

The SPACE website (www.csiss.org/SPACE) was improved significantly in year two, with the addition of more resources to aid instructors and a consolidation of discipline-related instructional resources. Stacy Rebich worked closely with the Webmaster on this project.
Data on the use of this site are presented in the section on 'Findings.'

A primary objective for 2005 was the integration of the website more closely with workshop and participant needs. Two primary enhancements were the inclusion of pages for Participant Contributions (http://www.csiss.org/SPACE/materials/participants) and for ACCESS conference presentations (http://www.csiss.org/SPACE/workshops/sessions.php). These provide examples of what SPACE participants have achieved in their teaching and student learning assessment initiatives.

Criteria for Applicant Selection (this statement appeared on the website to guide applicants):

The selection committee is looking for workshop participants who:
- Teach undergraduate courses in social science disciplines and programs in community colleges, colleges, and universities. Although individuals with faculty appointments are preferred for this program, a limited number of Ph.D. candidates (who give evidence of significant commitment to teaching undergraduate students) will be considered.
- Agree to include spatial perspectives and analysis in their undergraduate courses.
- Agree to complete follow-up surveys on their uses of the workshop experience to enhance their undergraduate courses and curriculum.
- Provide evidence in their application of commitment to undergraduate teaching and to developing curricula that exposes their students to the methodologies of spatial thinking.
- Are comfortable with computer file and data management and experienced in searching for research data over the Internet. For the workshops at UC Santa Barbara and Ohio State University, we seek applicants who have experience in applications of quantitative analysis and GIS in the social sciences.

Individuals selected to participate in the **UC Santa Barbara** workshop must bring a **laptop computer** for use in the workshop. The minimum specifications are for Windows XP/2000/NT(SP6a), 512 MB RAM, 1.0 GHz Processor, Internet Browser, CD-ROM, USB, and a Wireless card. Minimum free disk space is 1.0 GB (1,000 MB). See requirements for all ESRI software. Laptops are *not* required to participate in the workshops at San Francisco State University and at Ohio State University.

Scholarship Support

- There are no fees required to participate in a SPACE workshop.
- Participants may apply for awards of up to a maximum of $1000.
- Participants from designated minority institutions in the United States, and participants of Hispanic American, African American, or Native American background may be eligible for additional scholarship support.

In most cases, the SPACE scholarship award will not cover all of the costs for transportation, accommodations, and meals incurred by participants. You are encouraged to contact chairs of departments and deans at your institutions to seek funds to supplement the SPACE award. Participants within daily travel distance of the host institution may be admitted without scholarship support.

The Ideal Candidate for the UCSB Workshop (example of guidance on workshop selection)
The ideal candidate for this workshop will recognize the importance of integrated spatial social science as a worthy goal in both teaching and research. Even if they have novice skills in spatial analysis, they are driven to learn by their own teaching and research goals. This ideal candidate will also have a solid grounding in one of the social sciences, a minimum of one year as a primary undergraduate classroom instructor, and a competency with PC computing that includes moderate to advanced familiarity with Microsoft Excel (or comparable spreadsheet software), prior use of software for statistical analysis (e.g., SPSS, Stata, SAS, S-Plus, or Matlab) and/or GIS, and ability to execute basic file administration tasks (e.g., locating, copying, and renaming files). The candidate's statement of goals on the application form should document their objectives and preparation for the workshop.

SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Summer Workshops 2005
For Instructors of Undergraduate Courses in the Social Sciences

SPACE workshops are intended for instructors of undergraduate students in the social sciences. They offer content knowledge in methods of spatial analysis, instructional resources, and professional development support for curriculum planning and learning assessment. Successful applicants must commit to implementing spatial perspectives in their undergraduate courses and to providing feedback and documentation to evaluate the *SPACE* workshop program.

Participants in the program are eligible for **scholarship support** for subsistence. *The deadline for applications is 15 April 2005.* Details are available at www.csiss.org/SPACE/workshops.

GIS and Spatial Modeling for Use in Undergraduate Education
11-15 July 2005, Columbus OH

Topics covered: This workshop provides basic background in applications of spatial analytic techniques suited for undergraduate social science courses. The techniques considered include cartographic visualization, space-time modeling of individual behavior, spatial interaction models, spatial pattern analysis, and spatial optimization methods. The workshop considers resources for developing undergraduate course outlines, instructional modules, exercises, and learning assessment instruments. Basic familiarity with GIS and quantitative methods is desirable.
Instructors: Mei-Po Kwan (coordinator), Alan Murray, Morton O'Kelly, Kathryn Plank, Michael Tiefelsdorf, and Ningchuan Xiao (all of The Ohio State University)
Co-sponsor with CSISS and host institution: Dept. of Geography, The Ohio State University www.geography.ohio-state.edu

Spatial Analysis for the Undergraduate Social Science Curriculum
11–22 July 2005, Santa Barbara CA

Topics covered: This two-week workshop will integrate basic spatial methods (GIS, spatial statistics, and cartographic visualization) suited for application in the social sciences with curriculum development for undergraduate course work. Individual participants will focus on the design of course syllabi, instructional modules, and exercises that use spatial data and technologies, and on the assessment of student learning in these areas. Prior familiarity with spatial analysis and GIS is not required but interest in quantitative methods and basic computer literacy is assumed.
Instructors: Stuart Sweeney (coordinator), Fiona Goodchild, Michael Goodchild, Don Janelle, and Waldo Tobler (all of UCSB)
Co-sponsor with CSISS and host institution: Dept. of Geography, University of California, Santa Barbara www.geog.ucsb.edu, Institute for Social, Behavioral, and Economic Research www.isber.ucsb.edu

Introducing GIS for Undergraduate Social Science Courses
1-5 August 2005, San Fransisco CA

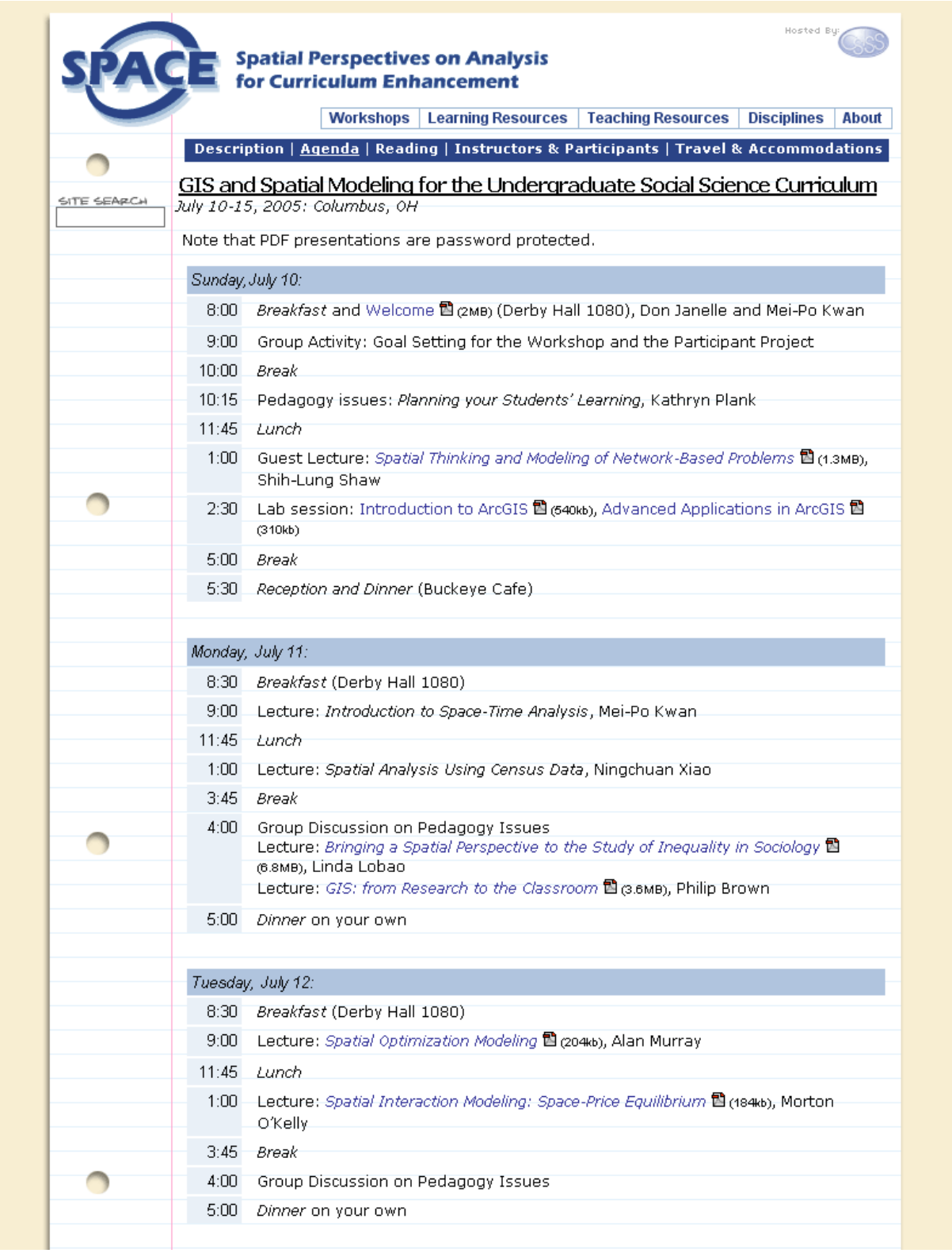
Topics covered: This workshop will introduce social science faculty to GIS and map making. Lectures will cover GIS fundamentals and key concepts, data visualization, and analytical cartography. Labs will consist of step-by-step exercises using material from urban studies, planning, public health, and social policy to teach basic GIS skills. Participants will work collaboratively with workshop leaders and other participants to design course materials for use in their own undergraduate teaching and in learning assessment. No prior familiarity with GIS or spatial analysis is required.
Instructors: Richard LeGates (coordinator), XiaoHang Liu, Barry Nickel and Ayse Pamuk (all of San Francisco State University)
Keynote speaker: Keith Clarke (UCSB)
Co-sponsor with CSISS: The University Consortium for Geographic Information Science www.ucgis.org
Host institution: Institute for Geographic Information Science, San Francisco State University gis.sfsu.edu

This program is funded by the National Science Foundation's Division of Undergraduate Education, under its program for Course, Curriculum & Laboratory Improvement – National Dissemination.

CSISS Center for Spatially Integrated Social Science
Spatial Resources for the Social Sciences

For Resources on Spatial Analysis in the Social Sciences, see www.csiss.org

Agenda for 2005 Workshops



SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Hosted By: CSISS

Workshops | Learning Resources | Teaching Resources | Disciplines | About

Description | Agenda | Reading | Instructors & Participants | Travel & Accommodations

SITE SEARCH

GIS and Spatial Modeling for the Undergraduate Social Science Curriculum

July 10-15, 2005: Columbus, OH

Note that PDF presentations are password protected.

Sunday, July 10:	
8:00	*Breakfast* and Welcome (2MB) (Derby Hall 1080), Don Janelle and Mei-Po Kwan
9:00	Group Activity: Goal Setting for the Workshop and the Participant Project
10:00	*Break*
10:15	Pedagogy issues: *Planning your Students' Learning*, Kathryn Plank
11:45	*Lunch*
1:00	Guest Lecture: *Spatial Thinking and Modeling of Network-Based Problems* (1.3MB), Shih-Lung Shaw
2:30	Lab session: Introduction to ArcGIS (540kb), Advanced Applications in ArcGIS (310kb)
5:00	*Break*
5:30	*Reception and Dinner* (Buckeye Cafe)
Monday, July 11:	
8:30	*Breakfast* (Derby Hall 1080)
9:00	Lecture: *Introduction to Space-Time Analysis*, Mei-Po Kwan
11:45	*Lunch*
1:00	Lecture: *Spatial Analysis Using Census Data*, Ningchuan Xiao
3:45	*Break*
4:00	Group Discussion on Pedagogy Issues Lecture: *Bringing a Spatial Perspective to the Study of Inequality in Sociology* (6.8MB), Linda Lobao Lecture: *GIS: from Research to the Classroom* (3.6MB), Philip Brown
5:00	*Dinner* on your own
Tuesday, July 12:	
8:30	*Breakfast* (Derby Hall 1080)
9:00	Lecture: *Spatial Optimization Modeling* (204kb), Alan Murray
11:45	*Lunch*
1:00	Lecture: *Spatial Interaction Modeling: Space-Price Equilibrium* (184kb), Morton O'Kelly
3:45	*Break*
4:00	Group Discussion on Pedagogy Issues
5:00	*Dinner* on your own

Wednesday, July 13:

8:30	*Breakfast* (Derby Hall 1080)
9:00	Lecture: *Introductory Example to Geographical Reasoning* (4.7MB), Michael Tiefelsdorf Lecture: *Spatial Pattern Analysis* (625kb), Michael Tiefelsdorf
11:45	*Lunch*
1:00	Guest Lecture: *Spatial Perspectives on Health and Social Issues* (2.5MB), Sara McLafferty
2:30	*Break*
2:45	Pedagogy issues: *Planning and Assessing Student Learning* (1.2MB), Kathryn Plank
5:00	*Break*
5:30	*Buffet Dinner* hosted by Department of Geography, the Ohio State University

Thursday, July 14:

8:30	*Breakfast* (Derby Hall 1080)
9:00	Pedagogy Discussion and Group Project
10:30	Concurrent Lab Sessions on all topics » Space-Time Analysis (Kwan) » Spatial Analysis Using Census Data (Xiao) » Spatial Optimization Modelling (Murray) » Spatial Interaction Modeling (O'Kelly) » Spatial Pattern Analysis (Tiefelsdorf)
11:45	*Lunch*
1:00	Concurrent Lab Sessions continues
2:30	*Break*
2:45	Group Project (Instructors hold office hour)
5:00	*Dinner* on your own

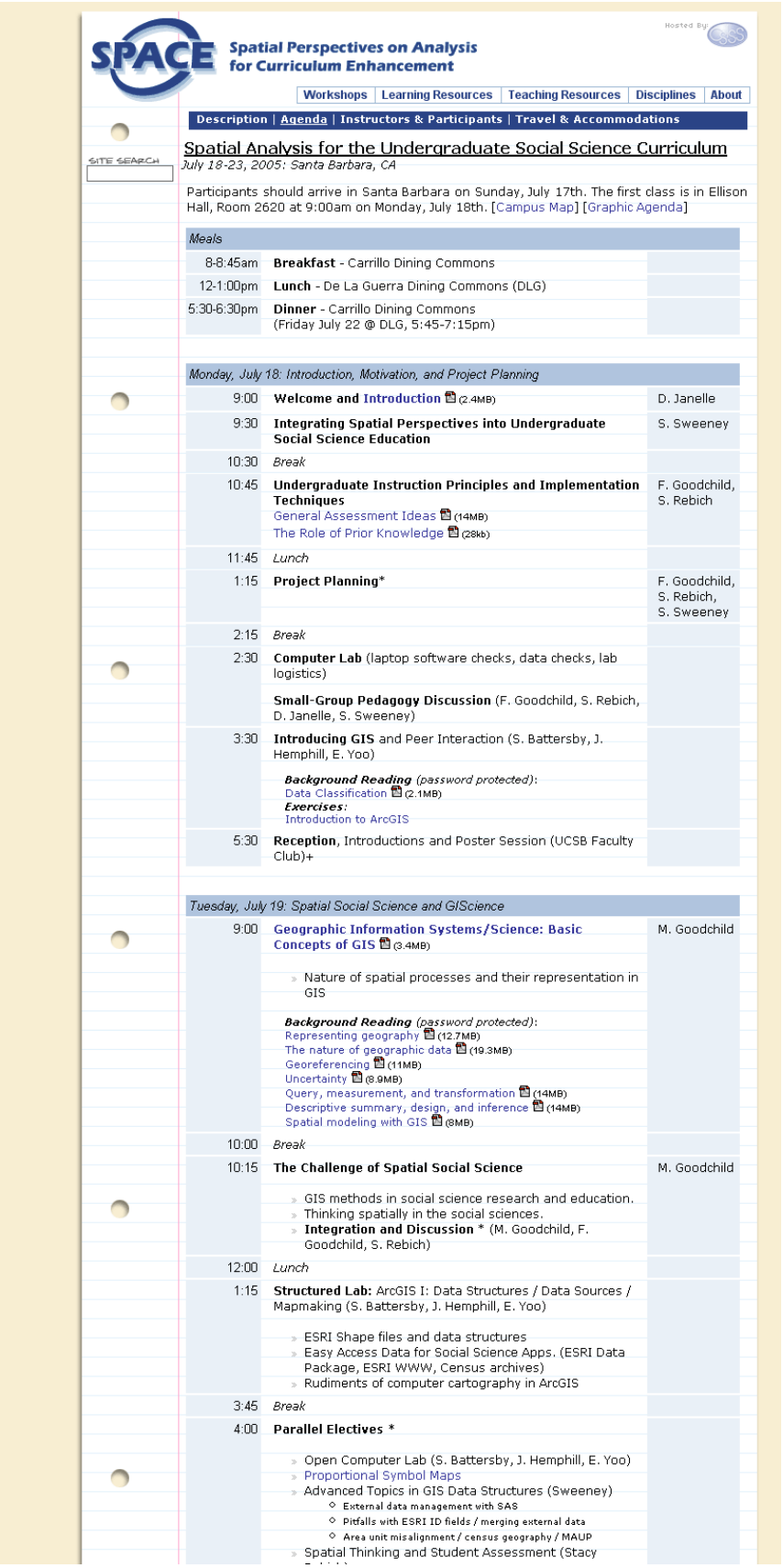
Friday, July 15:

8:30	*Breakfast* (Derby Hall 1080)
9:00	Group Presentation and Peer Feedback
11:45	*Lunch*
1:00	Group Presentation and Peer Feedback
3:30	Evaluation and Closing
5:00	*Dinner* on your own

Saturday, July 16:

	Participants depart Columbus

Printable Version



SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Hosted By: CSISS

Workshops | Learning Resources | Teaching Resources | Disciplines | About

Description | Agenda | Instructors & Participants | Travel & Accommodations

SITE SEARCH

Spatial Analysis for the Undergraduate Social Science Curriculum

July 18-23, 2005: Santa Barbara, CA

Participants should arrive in Santa Barbara on Sunday, July 17th. The first class is in Ellison Hall, Room 2620 at 9:00am on Monday, July 18th. [Campus Map] [Graphic Agenda]

Meals		
8-8:45am	**Breakfast** - Carrillo Dining Commons	
12-1:00pm	**Lunch** - De La Guerra Dining Commons (DLG)	
5:30-6:30pm	**Dinner** - Carrillo Dining Commons (Friday July 22 @ DLG, 5:45-7:15pm)	

Monday, July 18: Introduction, Motivation, and Project Planning		
9:00	**Welcome and Introduction** (2.4MB)	D. Janelle
9:30	**Integrating Spatial Perspectives into Undergraduate Social Science Education**	S. Sweeney
10:30	*Break*	
10:45	**Undergraduate Instruction Principles and Implementation Techniques** General Assessment Ideas (14MB) The Role of Prior Knowledge (28kb)	F. Goodchild, S. Rebich
11:45	*Lunch*	
1:15	**Project Planning***	F. Goodchild, S. Rebich, S. Sweeney
2:15	*Break*	
2:30	**Computer Lab** (laptop software checks, data checks, lab logistics) **Small-Group Pedagogy Discussion** (F. Goodchild, S. Rebich, D. Janelle, S. Sweeney)	
3:30	**Introducing GIS** and Peer Interaction (S. Battersby, J. Hemphill, E. Yoo) ***Background Reading*** *(password protected)*: Data Classification (2.1MB) ***Exercises***: Introduction to ArcGIS	
5:30	**Reception**, Introductions and Poster Session (UCSB Faculty Club)+	

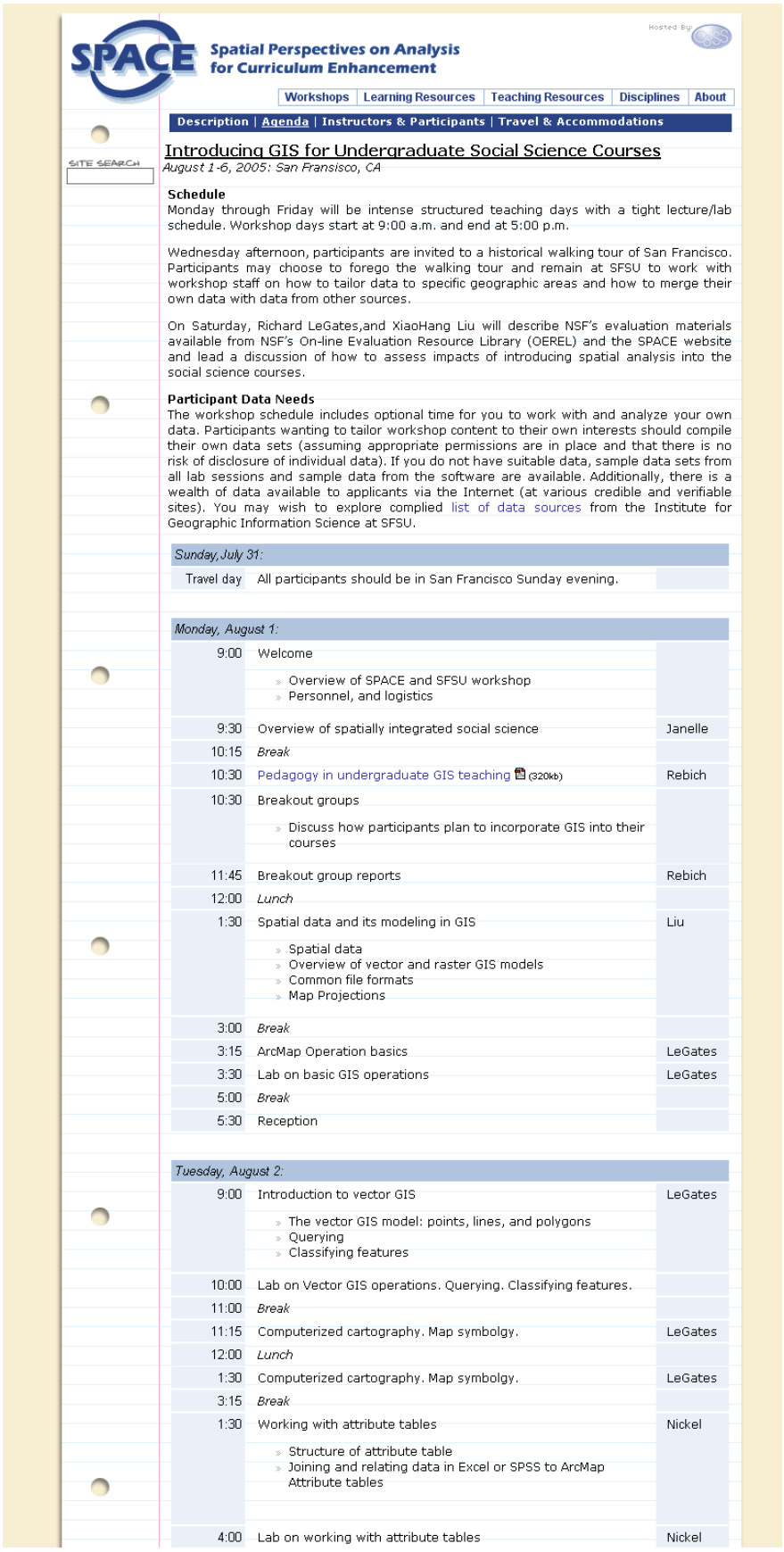
Tuesday, July 19: Spatial Social Science and GIScience		
9:00	**Geographic Information Systems/Science: Basic Concepts of GIS** (3.4MB) » Nature of spatial processes and their representation in GIS ***Background Reading*** *(password protected)*: Representing geography (12.7MB) The nature of geographic data (19.3MB) Georeferencing (11MB) Uncertainty (8.9MB) Query, measurement, and transformation (14MB) Descriptive summary, design, and inference (14MB) Spatial modeling with GIS (8MB)	M. Goodchild
10:00	*Break*	
10:15	**The Challenge of Spatial Social Science** » GIS methods in social science research and education. » Thinking spatially in the social sciences. » **Integration and Discussion** * (M. Goodchild, F. Goodchild, S. Rebich)	M. Goodchild
12:00	*Lunch*	
1:15	**Structured Lab:** ArcGIS I: Data Structures / Data Sources / Mapmaking (S. Battersby, J. Hemphill, E. Yoo) » ESRI Shape files and data structures » Easy Access Data for Social Science Apps. (ESRI Data Package, ESRI WWW, Census archives) » Rudiments of computer cartography in ArcGIS	
3:45	*Break*	
4:00	**Parallel Electives** * » Open Computer Lab (S. Battersby, J. Hemphill, E. Yoo) » Proportional Symbol Maps » Advanced Topics in GIS Data Structures (Sweeney) ◇ External data management with SAS ◇ Pitfalls with ESRI ID fields / merging external data ◇ Area unit misalignment / census geography / MAUP » Spatial Thinking and Student Assessment (Stacy	

Wednesday, July 20: Spatial Analytic Methods in Social Science Instruction		
6:00am	**Hike with Mike** - Foothills of Santa Ynez Mountains	
9:00	**Reflection and Goal Setting** *	F. Goodchild, S. Rebich, S. Sweeney
9:30	**Spatial Analytic Methods (exploratory / descriptive / inferential)** » Point data: SS methods / applications » Area data: SS methods / applications » Interaction data: SS methods / applications ***Background Reading*** *(password protected)*: GeoDa: An Introduction to Spatial Data Analysis (522kb) Under the Hood. Issues in the Specification and Interpretation of Spatial Regression Models (172kb) *Materials (password protected)*: Animations (5.2MB)	S. Sweeney
10:30	*Break*	
10:45	**Spatial Analytic Methods (exploratory / descriptive / inferential)** » Spatial analytic methods in social science research and education. » Added-value from spatial analytic methods » Spatial autocorrelation and relation to social science theories » Classroom demos versus student assignments / labs » **Integration and Discussion** * (Sweeney, F. Goodchild, S. Rebich)	S. Sweeney
12:00	*Lunch*	
1:15	**Structured Lab:** GeoDA: Exploratory Spatial Data Analysis » Reading ESRI Shape files and variable construction » EDA and ESDA utility and interpretation » Inferential pattern analysis / spatial autocorrelation.	S. Sweeney, K. Grace, E. Yoo
3:45	*Break*	
4:00	**Parallel Electives** * » Open Computer Lab (staffed by S. Battersby, J. Hemphill, E. Yoo) » Choropleth Maps with ArcGIS » Spatial Regression in GeoDA (Sweeney, K. Grace) ***Background Reading*** *(password protected)*: Spatial Dependence in Linear Regression Models (2.1MB) » Spatial econometric theory; Spatial error and spatial lag models » Specification tests and model interpretation » GeoDA application: Hedonic real estate model	
Thursday, July 21: Cartography / Visualization in Social Science Instruction		
6:00am	**Surf with Stuart**	
9:00	**Cartographic Visualization in Social Science Instruction** » Symbolizing point, line, and area features (13MB) ***Background Reading*** *(password protected)*: Sample evaluation criteria for maps (20kb) The Selection of Class Intervals (1.5MB) On Grouping for Maximum Homogeneity (593kb) Map Making for Social Scientists (9.1MB) Geographical Movement (1.6MB) Computer Cartograms (219kb) A Continuous Transformation Useful for Districting (225kb) Geographic Area and Map Projections (518kb) Pseudo-Cartograms (305kb)	S. Fabrikant
10:30	*Break*	
10:45	**Structured Lab:** ArcGIS II: Topics in Cartographic Communication » Classification ***Data Sources***: US Census FactFinder (census data) ESRI Census Watch (census data portal and information) ESRI Geography Network (tiger line data and tons of other spatial data) ***Exercise Material***: Example table Selecting good color schemes for maps cart/viz links by Slocum et al. (2004) ***Mapping Exercises*** *(password protected)*: Downloading map data, processing and classifying (70kb) Choropleth mapping with GIS (207kb)	S. Fabrikant, S. Battersby, J. Hemphill, E. Yoo
12:15	*Lunch*	
Afternoon	**Free Time** - Spatial events in Santa Barbara (depending on interest) or Santa Ynez Valley wine tasting (Stacy Rebich)	

Friday, July 22: Spatial Interaction, Pedagogy, and Project Development		
9:00	**Issues in Teaching and Learning** Chair: Fiona Goodchild Panel: Claude Barnes, Mike Goodchild, Brian Lee, Diana Sinton	
10:30	*Break*	
10:45	**Movement and Flows** » Flow representation and mapping » Gravity & entropy models » The transportation problem, linear and quadratic » **Integration and Discussion***	W. Tobler
	Background Reading *(password protected):* *Migration* (970kb) ***Links:*** Tobler's Reprinted Articles on Migration	
12:00	*Lunch*	
1:15	**Structured Lab:** Flowmapper » Integration with other software	W. Tobler, S. Battersby, J. Hemphill, K. Grace, E. Yoo
2:15	**Open Computer Lab**	S. Battersby, K. Grace, J. Hemphill, E. Yoo
Saturday, July 23: Project Presentations / Closing Session		
9:00	**Participant Presentations and Peer Feedback** » 10 minute presentation, 5 minute discussion (maximum of 10 PowerPoint slides) » Peer review for each participant	
12:00	*Lunch*	
1:15	**Participant Presentations and Peer Feedback** » 10 minute presentation, 5 minute discussion. » Peer review for each participant	
3:15	*Break*	
3:30	**Participant Presentations and Peer Feedback** » 10 minute presentation, 5 minute discussion. » Peer review for each participant	
4:30	**Closing Comments**	D. Janelle, S. Sweeney, F. Goodchild
6:00	**BBQ Dinner and workshop Awards** (Goleta Beach)	
Sunday, July 24: Participants Depart Santa Barbara		

* **Definitions**

Project Planning / Goal Setting - Workshop participants are expected to work on a project related to their curriculum and course development. This will be the basis of a final presentation from each participant towards the end of the workshop.
Poster Session - Describe who you are and your role at your home institution. Discuss your interest in spatial analysis and provide examples of how you may have or would like to incorporate spatial analytic perspectives in the undergraduate curriculum. Posters will be the focus for participant and instructor interaction at the reception on the first day of the workshop.
Reflection and Goal Setting - The early morning reflection sessions are opportunities to raise any issues and questions that are of concern to participants and instructors. Participants may also discuss their goals for the day and for project completion.
Integration / Discussion - An opportunity to clarify the pedagogic implications of the preceding presentations.
Parallel Electives - Participants may choose options that best reflect their interests and needs. Topics for parallel sessions are flexible and may be suggested by participants at any time during the workshop. These will allow for small-group and more in-depth treatment of topics than would be possible in larger groups.



SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Hosted By: SSDS

Workshops | Learning Resources | Teaching Resources | Disciplines | About

Description | Agenda | Instructors & Participants | Travel & Accommodations

SITE SEARCH

Introducing GIS for Undergraduate Social Science Courses

August 1-6, 2005: San Fransisco, CA

Schedule

Monday through Friday will be intense structured teaching days with a tight lecture/lab schedule. Workshop days start at 9:00 a.m. and end at 5:00 p.m.

Wednesday afternoon, participants are invited to a historical walking tour of San Francisco. Participants may choose to forego the walking tour and remain at SFSU to work with workshop staff on how to tailor data to specific geographic areas and how to merge their own data with data from other sources.

On Saturday, Richard LeGates,and XiaoHang Liu will describe NSF's evaluation materials available from NSF's On-line Evaluation Resource Library (OEREL) and the SPACE website and lead a discussion of how to assess impacts of introducing spatial analysis into the social science courses.

Participant Data Needs

The workshop schedule includes optional time for you to work with and analyze your own data. Participants wanting to tailor workshop content to their own interests should compile their own data sets (assuming appropriate permissions are in place and that there is no risk of disclosure of individual data). If you do not have suitable data, sample data sets from all lab sessions and sample data from the software are available. Additionally, there is a wealth of data available to applicants via the Internet (at various credible and verifiable sites). You may wish to explore complied list of data sources from the Institute for Geographic Information Science at SFSU.

Sunday, July 31:		
Travel day	All participants should be in San Francisco Sunday evening.	

Monday, August 1:		
9:00	Welcome » Overview of SPACE and SFSU workshop » Personnel, and logistics	
9:30	Overview of spatially integrated social science	Janelle
10:15	*Break*	
10:30	Pedagogy in undergraduate GIS teaching (320kb)	Rebich
10:30	Breakout groups » Discuss how participants plan to incorporate GIS into their courses	
11:45	Breakout group reports	Rebich
12:00	*Lunch*	
1:30	Spatial data and its modeling in GIS » Spatial data » Overview of vector and raster GIS models » Common file formats » Map Projections	Liu
3:00	*Break*	
3:15	ArcMap Operation basics	LeGates
3:30	Lab on basic GIS operations	LeGates
5:00	*Break*	
5:30	Reception	

Tuesday, August 2:		
9:00	Introduction to vector GIS » The vector GIS model: points, lines, and polygons » Querying » Classifying features	LeGates
10:00	Lab on Vector GIS operations. Querying. Classifying features.	
11:00	*Break*	
11:15	Computerized cartography. Map symbolgy.	LeGates
12:00	*Lunch*	
1:30	Computerized cartography. Map symbolgy.	LeGates
3:15	*Break*	
1:30	Working with attribute tables » Structure of attribute table » Joining and relating data in Excel or SPSS to ArcMap Attribute tables	Nickel
4:00	Lab on working with attribute tables	Nickel

Wednesday, August 3:		
9:00	Introduction to raster GIS	Liu
10:30	*Break*	
10:45	Lab exercise on raster-based spatial analysis	
12:00	*Lunch*	
1:30	Optional open lab. Participants work on their own, individually, or in groups (with technical support).	
2:30	Walking tour of San Francisco* (optional)	

Thursday, August 4:		
9:00	Vector-based spatial analysis - Overlay, clip, dissolve, buffer, and related operations etc.	Nickel
10:30	*Break*	
10:45	Lab exercise on vector based spatial data analysis	
12:00	*Lunch* followed by keynote speaker	
1:00	Keith Clarke (UCSB): "Spatially enhanced social science"	
2:00	*Break*	
2:15	Group discussion of how participants might incorporate spatial analysis into their teaching	Clarke
3:00	*Break*	
3:15	Spatial data acquisition	Liu
4:15	Lab exercise on geocoding	

Friday, August 5:		
9:00	Working with census data	Pamuk
10:00	*Break*	
10:15	Lab exercise on downloading census data and preparing a data set tailored to your area and interests	Pamuk
12:00	*Lunch*	
1:30	Evaluating spatial learning outcomes (193kb)	Rebich
3:15	*Break*	
3:15	Open lab with technical support	

Saturday, August 6:		
9:00	Closing workshop procedures	
9:15	Demo of GIS resources	
10:30	*Break*	
10:45	Participants discussion on curriculum design	
12:00	*Lunch*	
1:00	Reports/discussion of curriculum design discussions	
2:00	Workshop closes	

* **"San Francisco By Foot" walk**
We are proud to offer our famous guided walk through the historic districts of San Francisco hosted by Max Kirkeburg. Max has been leading a class by the same name for a number of years and will wow you with his insight and historical knowledge of the area.

Weekends
If you arrive early or stay additional time following the workshop, you may wish to explore some of the amenities of the region and special events. Some of these are listed at:

http://www.sanfrancisco.com/
http://www.lonelyplanet.com/destinations/north_america/san_francisco/

Other Questions?
Contact Christian Brown for questions regarding funding and the instructional programs, and Richard LeGates for questions regarding the workshop and accommodations.

Printable Version

PARTICIPANTS IN THE SUMMER 2005 SPACE WORKSHOPS:

Ohio State University

- **Adegoke Ademiluyi**, Human Geography, Fayetteville State University
- **Samuel Adu-Prah**, Geographic Information Science, Alcorn State University
- **Nairne Cameron**, Geographic Information Science, University of Alberta
- **Jinmu Choi**, Geographic Information Science, University of Georgia
- **Christopher Cusack**, Human Geography, Keene State College
- **Bernadette De Leon**, Public Health, Indiana University
- **Yuri Gorokhovich**, Geographic Information Science, Columbia University
- **Lynn Harvey**, Sociology, Winston-Salem State University
- **Rajrani Kalra**, Urban Studies, Kent State University
- **Sunwoong Kim**, Economics, University of Wisconsin-Milwaukee
- **Kevin Leander**, Human Geography, Vanderbilt University
- **Jiyeong Lee**, Geographic Information Science, University of North Carolina-Charlotte
- **Sun Park**, Geographic Information Science, University of Hawaii-Hilo
- **Karin Pfeffer**, Geographic Information Science, University of Amsterdam
- **Clara Popa**, Communication Studies, Rowan University
- **Alexander Prishchepov**, Geographic Information Science, Oklahoma State University
- **Julio Rivera**, Human Geography, Carthage College
- **Shouraseni Sen Roy**, Geographic Information Science, Arizona State University
- **Talar Sahsuvaroglu**, Human Geography, McMaster University
- **Jungyul Sohn**, Regional Science, University of Memphis
- **Stephen Truhon**, Psychology, Winston-Salem State University
- **Paul Von Hippel**, Sociology, Ohio State University
- **Cecile Yancu**, Public Health, Winston-Salem State University
- **Li Yin**, Urban and Regional Planning, State University of New York-Buffalo

University of California, Santa Barbara

- **Claude Barnes**, Political Science, North Carolina A&T State University
- **Janice Bell**, Public Health, University of Washington
- **Sheryl Breen**, Political Science, St. Olaf College
- **Sung Chun**, Sociology, University of Notre Dame
- **Marlese Durr**, Sociology, Wright State University
- **Owen Dwyer**, Human Geography, Indiana University-Indianapolis
- **Jennifer Earl**, Sociology, University of California-Santa Barbara
- **Joe D. Francis**, Sociology, Cornell University
- **Kurt Fuellhart**, Human Geography, Shippensburg University
- **Laurie Garo**, Geographic Information Science, University of North Carolina-Charlotte
- **Randolph Horn**, Political Science, Samford University
- **Mary Lou Larson**, Anthropology, University of Wyoming
- **Brian Lee**, Landscape Architecture, University of Kentucky
- **Kevin Marsh**, History, Idaho State University
- **Georgina Moreno**, Economics, Scripps College
- **Steven Perlmutter**, Political Science, College of William and Mary
- **Heather Richards**, Archaeology, University of New Mexico

- **Glenwood Ross**, Economics, Morehouse College
- **Diana Sinton**, Geographic Information Science, National Institute for Technology & Liberal Education
- **Jon Sonstelie**, Economics, University of California-Santa Barbara
- **Sudhir Thakur**, Human Geography, University of North Dakota
- **Judith Van der Elst**, Archaeology, University of New Mexico

San Francisco State University (for UCGIS)

- **Jeana Abromeit**, Sociology, Alverno College
- **Philip Birge-Liberman**, Human Geography, Syracuse University
- **Bettina Bergmann**, Humanities, Mount Holyoke College
- **Giovanna di Chiro**, Environmental Studies & Policy, Mount Holyoke College
- **Vernon Domingo**, Human Geography, Bridgewater State College
- **Paulla Ebron**, Research and Technology, Stanford University
- **Robert Eng**, History, University of Redlands
- **Claudia Engel**, Education, Stanford University
- **Annalise Fonza**, Urban Planning and Politics, Mount Holyoke College
- **Benjamin Forest**, Human Geography, Dartmouth College
- **Theresa Garvin**, Human Geography, University of Alberta
- **Susan Handy**, Environmental Studies & Policy, University of California-Davis
- **Kathryn Henderson**, Sociology, Texas A&M University
- **Christopher Holoman**, Political Science, Hilbert College
- **Gareth John**, Human Geography, Gustavus Adolphus College
- **Ka mutombo Kabasele**, Demography, Xavier University
- **Mona Ray**, Economics, Morehouse College
- **Isaac Robinson**, Sociology, North Carolina Central University
- **Sue Steiner**, Community Studies/Policy, Arizona State University
- **Alan Trevithick**, Anthropology, Westchester Community College
- **Anibal Yanez-Chavez**, Human Geography, California State University-San Marcos

FOLLOW-UP ACTIVITIES FOR 2004 WORKSHOP PARTICIPANTS:

The calls for applications for the SPACE Awards and for ACCESS conference proposals are provided below. Consistent with standards of good science, the adjudication panel of the SPACE project's PI, Co-PIs, and workshop instructors were assigned the task of achieving a balanced distribution of awards across disciplines and across topical research domains.

These programs were started in 2005, drawing primarily on participants in the 2004 workshop program:

Call for Applications for a SPACE Instructional Development Award

SPACE invites applications from faculty at four-year colleges and universities for instructional development awards (up to four), to fund (up to $1500 of verified expenses) program activities for spatial thinking in undergraduate social science education:

- Present a conference paper about teaching spatial thinking at the undergraduate level in the social sciences.
- Participate in a workshop or training program on uses of spatial analysis/GIS software (e.g., a GIS vendor workshop, ICPSR workshop with Luc Anselin).
- Participate in a professional workshop dedicated to instruction and student learning of spatial analysis concepts and technology.

To apply, you must have attended a SPACE workshop in 2004. Please submit:

- Evidence of achievement in meeting instructional goals to implement spatial approaches in your undergraduate course(s) or programs.

  Examples might include a new syllabus, curriculum development or assessment resources, a superb example of a student course project, and efforts to enhance the diversity of students who benefit from spatial perspectives. Please specify how your instructional development initiatives have benefited the advancement of spatial perspectives in undergraduate education.

- A statement of how the SPACE workshop inspired and / or supported your achievement.
- Commitment to prepare a short case study or example of your achievement for posting on the SPACE website.
- A description of how you would use the expense allocation of up to $1500 to enhance your instruction of spatial approaches or to help in the dissemination of spatial methodologies to students and colleagues.

Call for Proposals for ACCESS (Academic Conference Courses to Enhance Spatial Science)

The ACCESS program is described on the website as follows:

SPACE sponsors special sessions, short courses, and short workshops on curricula development at annual conferences of academic associations. When appropriate, these sessions and short workshops will feature instructors and participants from prior SPACE workshop and symposia programs, and involve educators from the host disciplines of the conference. These may feature demonstrations of how spatial analysis brings added value to instructional programs; others might focus on hands-on instruction in specific spatial methodologies (e.g., spatial visualization of geo-referenced data), or will address issues regarding student needs, expectations, and assessment of learning. These conference-related events are intended to broaden exposure to the availability of SPACE programs - an opportunity to advertise workshops, and to

alert instructors to hardcopy and online resources that might assist their classroom offerings and professional development. In addition, the conference setting exposes SPACE personnel to the interests, culture, and needs of scholars from diverse disciplinary backgrounds, enabling more informed and responsive programs for the annual workshop program.

For previously funded ACCESS sessions, see http://www.csiss.org/SPACE/workshops/sessions.php

Instructions on Applying for Sponsorship of Conference Programs
If you are interested in seeking modest financial support from SPACE, you will need to profile the conference/organization and explain why it provides an appropriate venue for SPACE outreach, and also demonstrate that the workshop plan is consistent with the objectives of SPACE. In a 2-page proposal, please describe the following:

- The Organization (description, objectives, membership)
- The Conference (where, when, purpose / general themes, number of participants, disciplinary mix)
- The Proposed Workshop:
- Title, duration (half-day / full-day?)
- Instructors (brief profile)
- Objectives (see: http://www.csiss.org/SPACE/about/mission.php)
- Agenda
- Advertising strategy to attract participants
- Anticipated attendance and disciplinary background of participants
- Estimated Budget

Organizers who are supported by SPACE agree to the following:

- To provide SPACE with a brief report on the outcomes of the workshop: list of attendees (discipline), contact information, and details on any workshop-related follow-through activities;
- To include a representative from SPACE in the organization and presentation of the workshop;
- To post an announcement about the workshop on the SPACE site, borrowing heavily from the proposal;
- To post appropriate workshop PowerPoint presentations (pdf format) and workshop-related instructional resources; and
- To provide documentation for assessing participant evaluations (from a short post-workshop survey)

The SPACE financial commitment to conference workshop organizers/instructors is to cover travel, conference registration, lodging (only 2 nights) and per diem; SPACE will support the workshop instruction period rather than the full conference participation of workshop leaders. If you are bringing in a special guest presenter for the workshop, a modest honorarium may be considered. SPACE reserves the right to modify this formulation based on the cost considerations of meeting venues and on the availability of funds.

Workshop Follow-up Survey

A draft of a follow-up survey of workshop participants (to be administered approximately 10 to 12 months following annual workshops) was reviewed at the December 2004 SPACE Planning Meeting. It was administered over a secure website in spring 2005. The results are presented in the "Findings" section of this report.

FINDINGS
SPACE: RESULTS FOR YEAR TWO

The SPACE program effectively recruited young faculty from a range of social science disciplines. The application pool was impressive and diverse, especially in terms of the range of institutions that were represented. The faculty were not only interested in learning more about spatial analysis and technology, but they were active in exploring how to integrate this approach into their undergraduate courses. Several comments on the final surveys indicated that the SPACE program provides a unique opportunity for faculty to compare notes and resources that will improve their credibility and potential to make innovations at their home institutions.

SPACE has a specific goal to assist faculty in using new approaches to spatial analysis, including databases and software packages. Each of the summer workshops provided outstanding facilities and instruction that enabled the participants to the get hands-on experience that is critical in terms of preparing them to be innovative teachers. At the end of the summer sessions, participants made presentations that reflected their current interest in engaging students in new exercises and projects. Some of these were better developed than others in terms of providing specific examples. Most of them indicated that they had gained confidence in being able to introduce GIS, GeoDa (spatial econometrics software), and other spatial tools to their undergraduates.

The Results of the second-year activities of the SPACE project reveal significant success in some areas and challenges that need attention as the project moves into its third year. These are summarized in this section under the following headings:

I. Applicant Selection and Participation
II. Forms for Applications and for Participant Entry / Exit Surveys
III. Results from Application / Entry / Exit Surveys
IV. Commentary by 2005 Workshop and Educational Development Coordinators
V. Pedagogic Resources (Examples from the UCSB Workshop)
VI. Follow-up Survey of 2004 Workshop Participants and Results from the Educational Development Awards Program
VII. Use of SPACE Website 2005

Both participants and instructors evaluated the three workshops in year two favorably. Nonetheless, the results point to challenges for improving future workshops. The primary areas of control over workshop outcomes relate to the selection of participants, the structuring of workshop content (see agenda outlines under Activities), and the balance between content learning and education development initiatives.

I. APPLICANT SELECTION AND PARTICIPATION

Application advertising yielded at total of 99 applicants to fill a maximum of 70 workshop positions in year two. The evaluation criteria, worked out in the December 2004 planning meeting, stressed experience with computers and a favorable disposition to rigorous analysis, enthusiasm and commitment to teaching undergraduate students, representation from across the social science disciplines, and incentives for the selection of designated minority candidates. We were also interested in achieving a reasonable level of homogeneity in prior experience with spatial methods in each of the workshops. Offers to 79 of the applicants resulted in 68 final acceptances, 1 dropping out at the last moment, and 67 actually completing the workshops. Individuals who declined offers cited the difficulty of scheduling as the primary factor, along with health issues, and previously unanticipated family and work obligations. The following table provides specific details. The discipline breakdown reflects prevailing patterns of academic activity in the area of spatial analysis. Acceptance rates for applicants from geography and GIS were deliberately low in order to weight the participant numbers to social sciences with high potential for new dissemination. Geographers and current GIS instructors were steered to the Ohio State University workshop whenever possible. Those with limited or no prior experience were encouraged to attend the workshop at San Francisco State University.

Owing to their potential for achieving greater immediate dissemination, existing university faculty members with PhDs, were favored (72% accepted) over applicants still in student status (approximately 54% accepted).

Women (at 81%) were admitted at a higher rate than men (60%). This relates to the higher proportion of male applicants with student status and geography/GIS background.

Success in reaching designated minority individuals exceeded our expectations – resulting in 18 of 99 applicants from Hispanic American and African American communities, and from HBCUs. An extra financial stipend was available to assist their participation.

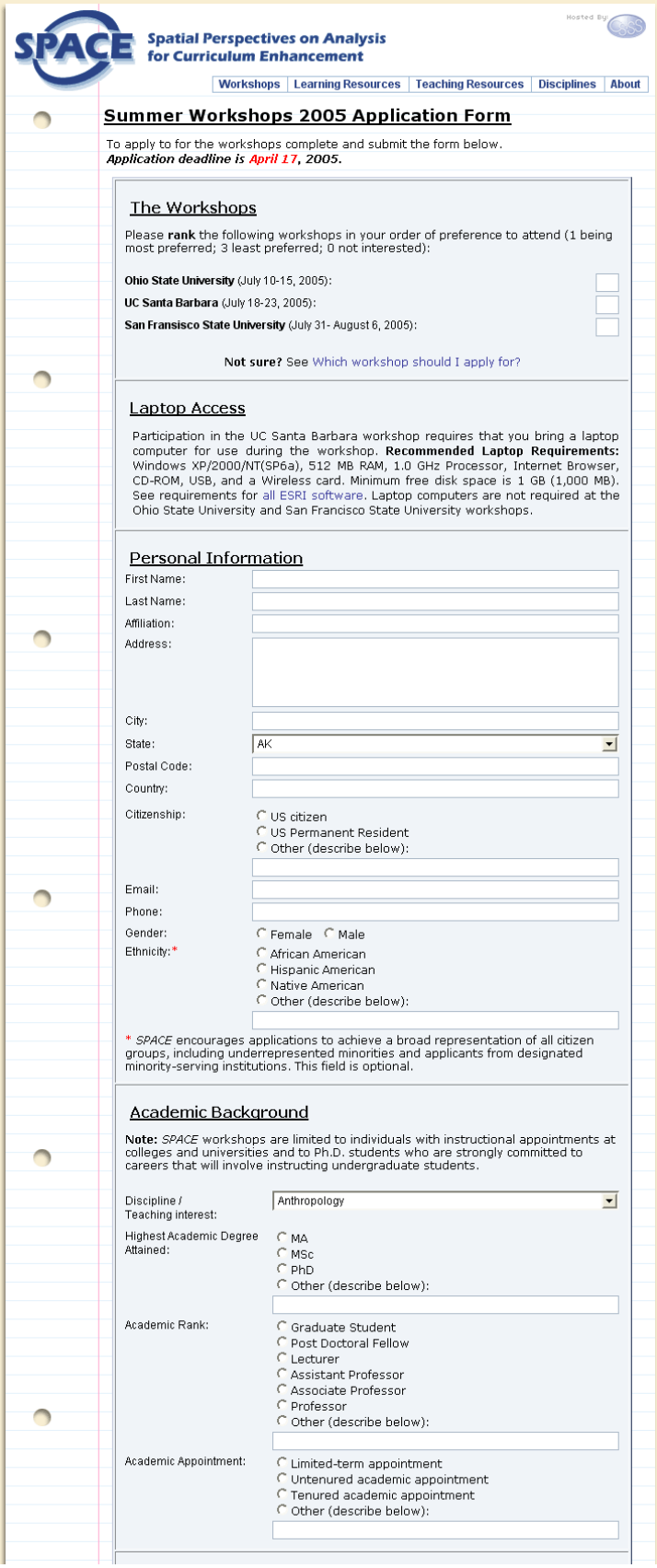
SPACE Applicants and Participants by Discipline, Gender, Degree (2005)

	Participants by Workshop			Totals		Percent Applicants Accepted
	OSU	UCSB	SFSU	Participants	Applicants	
Anthropology	2	1	5	8	12	67
Archaeology		2		2	3	67
Demography			1	1	1	100
Economics	1	3	1	5	7	71
Environmental Studies/Policy			2	2	7	29
GIS	9	2		11	19	58
History		1	1	2	3	67
Geography	5	3	6	14	19	74
Political Science		4	1	5	6	83
Public Health	2	1		3	3	100
Regional Science	1			1	1	100
Sociology	2	4	3	9	11	82
Urban & Regional Plan	1	1	1	3	6	50
Urban Studies	1			1	1	100
Totals:	24	22	21	67	99	
Male	15	12	10	37	62	60
Female	9	10	11	30	37	81
Desig. Minority						
Offered	8	4	6	18	18	100
Attended	7	4	6	17	17	100
PhD	19	16	19	54	75	72
PhD Candidate	2	2	1	5	6	83
MS	3	1		4	9	44
MA/MEd/MBA		3	1	4	7	57
MURP				0	1	0
BS/BA				0	1	0
					99	
Offered / Could Not Attend	5	2	5	--	12	
Applicants - Workshop as First Choice	25	36	38			**Percent Completion**
Participants - Completing:						
--Workshop	24	21	21	66		99
--Entry Survey	22	22	21	65		97
--Exit Survey	22	22	19	63		94

II. Forms for Applications and for Participant Entry / Exit Surveys

Significant care was addressed to the design of surveys to permit informed decisions for (a) selecting participants from the applicant pool, (b) refining the design of workshops based on the experience and aspirations of those selected, and (c) evaluating the overall success of the workshop program from the perspectives of participants.

Copies of the Application, Entry and Exit surveys for 2005 are attached on the following pages. The application survey provided the primary information for selecting participants, including quantitative indicators of their self-assessed background in dealing with curricula issues and with spatial approaches to analysis. The design of the exit survey was intended to provide a close match to the workshop goals that participants cited in their entry surveys. The Entry and Exit surveys included questions about (a) the barriers that participants perceive to the adoption of spatial analysis in undergraduate teaching, (b) their aspirations for gaining technical content knowledge and insights for teaching and assessment, (c) what they hope to learn from engagement with fellow workshop participants, and (d) what they hope to learn from workshop lecturers regarding spatial analysis concepts and pedagogical strategies. Results are presented section III.



SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Hosted By: CSS

Workshops | Learning Resources | Teaching Resources | Disciplines | About

Summer Workshops 2005 Application Form

To apply to for the workshops complete and submit the form below.
Application deadline is April 17, 2005.

The Workshops

Please **rank** the following workshops in your order of preference to attend (1 being most preferred; 3 least preferred; 0 not interested):

Ohio State University (July 10-15, 2005):
UC Santa Barbara (July 18-23, 2005):
San Fransisco State University (July 31- August 6, 2005):

Not sure? See Which workshop should I apply for?

Laptop Access

Participation in the UC Santa Barbara workshop requires that you bring a laptop computer for use during the workshop. **Recommended Laptop Requirements:** Windows XP/2000/NT(SP6a), 512 MB RAM, 1.0 GHz Processor, Internet Browser, CD-ROM, USB, and a Wireless card. Minimum free disk space is 1 GB (1,000 MB). See requirements for all ESRI software. Laptop computers are not required at the Ohio State University and San Francisco State University workshops.

Personal Information

First Name:
Last Name:
Affiliation:
Address:
City:
State: AK
Postal Code:
Country:
Citizenship: ○ US citizen ○ US Permanent Resident ○ Other (describe below):
Email:
Phone:
Gender: ○ Female ○ Male
Ethnicity:* ○ African American ○ Hispanic American ○ Native American ○ Other (describe below):

* *SPACE* encourages applications to achieve a broad representation of all citizen groups, including underrepresented minorities and applicants from designated minority-serving institutions. This field is optional.

Academic Background

Note: *SPACE* workshops are limited to individuals with instructional appointments at colleges and universities and to Ph.D. students who are strongly committed to careers that will involve instructing undergraduate students.

Discipline / Teaching interest: Anthropology
Highest Academic Degree Attained: ○ MA ○ MSc ○ PhD ○ Other (describe below):
Academic Rank: ○ Graduate Student ○ Post Doctoral Fellow ○ Lecturer ○ Assistant Professor ○ Associate Professor ○ Professor ○ Other (describe below):
Academic Appointment: ○ Limited-term appointment ○ Untenured academic appointment ○ Tenured academic appointment ○ Other (describe below):

Teaching Experience

How many years have you been teaching at the college/university level?

Please list the titles and academic levels of courses you have taught in the past 2 years.

Do you currently teach spatial approaches in your undergraduate courses? If so, please describe.

Have you participated in instructional development and professional development programs offered through your institution, discipline organizations, or other agencies? Please describe.

Please describe your experience with course evaluation and student assessment.

Please list any previous CSISS, SPACE, or ICPSR spatial analytic workshops that you completed.

Concept Familiarity

Rate your proficiency in the following areas where:

- 1 = No familiarity
- 2 = Familiar with concepts
- 3 = Experience with applications
- 4 = Know enough to teach
- 5 = Expert

	1	2	3	4	5
Spatial thinking:	○	○	○	○	○
Cartography/map making:	○	○	○	○	○
Data and computer file management:	○	○	○	○	○
Internet search and information retrieval:	○	○	○	○	○
Graphic visualization of data:	○	○	○	○	○
Qualitative methods in social science:	○	○	○	○	○
Quantitative methods in social science:	○	○	○	○	○
Undergraduate curriculum development:	○	○	○	○	○
Geographic Information Systems (GIS):	○	○	○	○	○
Spatial statistics:	○	○	○	○	○
Geocoding:	○	○	○	○	○
Global Positioning Systems:	○	○	○	○	○
Remote sensing:	○	○	○	○	○
Other (describe below):	○	○	○	○	○

Software Experience

Please list any software that you currently use for research:

Please list any software that you have students use in your classes:

Do you and your students have access to spatial analytic software at your institution? Please describe:

SPACE Workshop Referral

How did you learn about the SPACE Workshop Program?

- The SPACE/CSISS Website
- SPACE Workshop flyer
- Colleague
- Newsletter (please specify below)
- List Serve (please specify below)
- Other (please specify below)

Personal Workshop Goals

How do you hope/plan to use the workshop experience to enhance your undergraduate courses, programs, and student learning experiences?:

Other Comments:

Scholarship Support

There are no fees required for participation in the CSISS SPACE Workshops.

However, participants are encouraged to seek funding from their own institutions to cover transportation, lodging, meals, books, and access to a laptop (required for UCSB workshop, see above).

Stipends are available for all qualifying applicants, with a priority given to candidates that best fit the profile for meeting the objectives of SPACE.

Please indicate the level of stipend support that you are applying for:

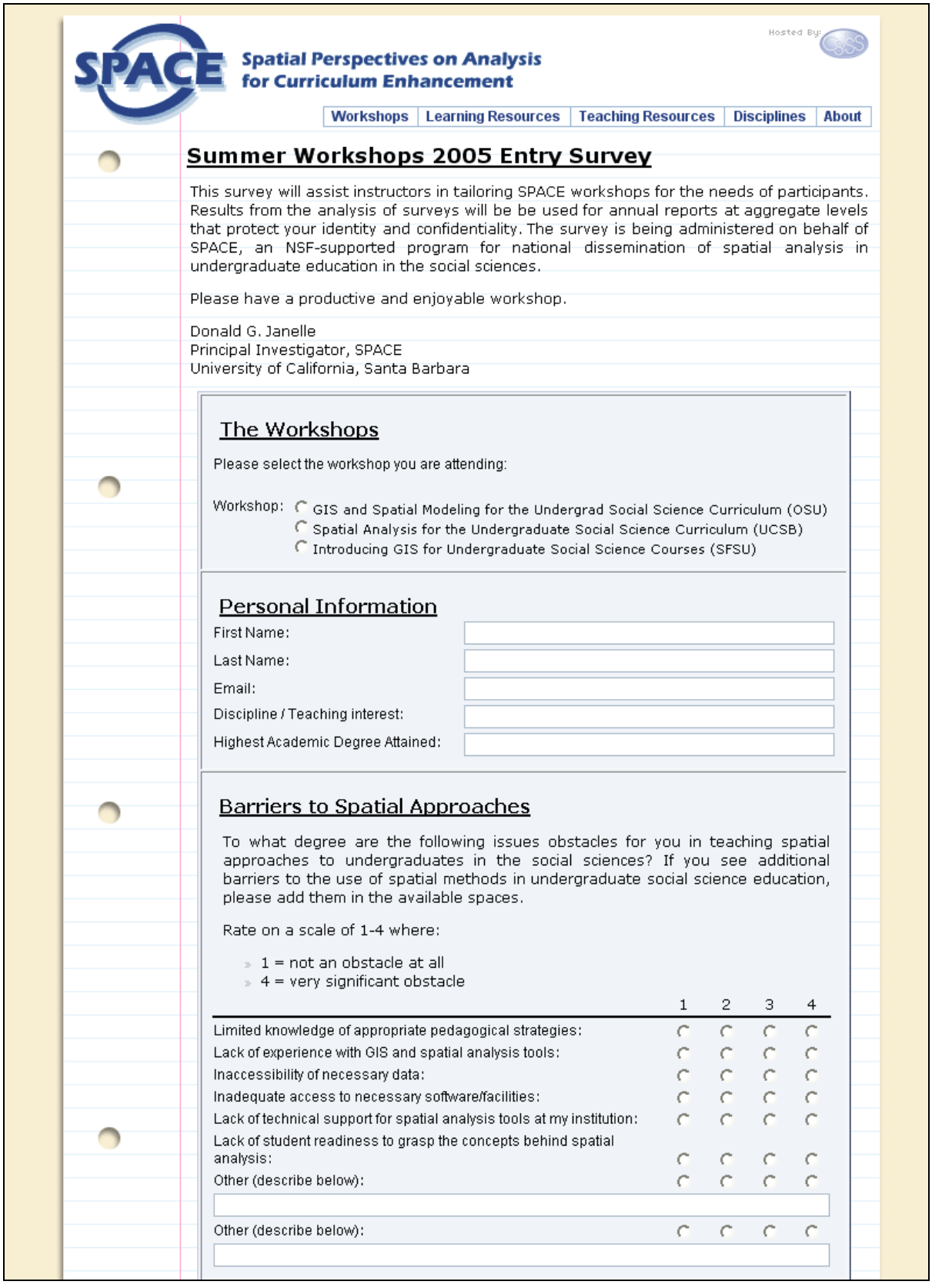
- Admission without funding
- Scholarship support for $500
- Scholarship support for $750
- Scholarship support for $1000 (maximum level of support)

All workshop participants are expected to attend the full six days of workshop instruction.

Decisions on acceptance of applications will be made by April 25, 2005 and invited applicants will be expected to confirm attendance by May 2, 2005. Confirmation of acceptance will require the completion of a entry survey that will allow the organizers to tailor the workshop content to the needs of the audience.

I have read the above statement. If I am selected for the workshop, I agree to cover the expenses noted and to participate for the full duration of the workshop. By submitting this application, I confirm my agreement with the above statement.

Reset Form | Submit Form



SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Hosted By: CSISS

Workshops | Learning Resources | Teaching Resources | Disciplines | About

Summer Workshops 2005 Entry Survey

This survey will assist instructors in tailoring SPACE workshops for the needs of participants. Results from the analysis of surveys will be be used for annual reports at aggregate levels that protect your identity and confidentiality. The survey is being administered on behalf of SPACE, an NSF-supported program for national dissemination of spatial analysis in undergraduate education in the social sciences.

Please have a productive and enjoyable workshop.

Donald G. Janelle
Principal Investigator, SPACE
University of California, Santa Barbara

The Workshops

Please select the workshop you are attending:

Workshop:
- GIS and Spatial Modeling for the Undergrad Social Science Curriculum (OSU)
- Spatial Analysis for the Undergraduate Social Science Curriculum (UCSB)
- Introducing GIS for Undergraduate Social Science Courses (SFSU)

Personal Information

First Name:
Last Name:
Email:
Discipline / Teaching interest:
Highest Academic Degree Attained:

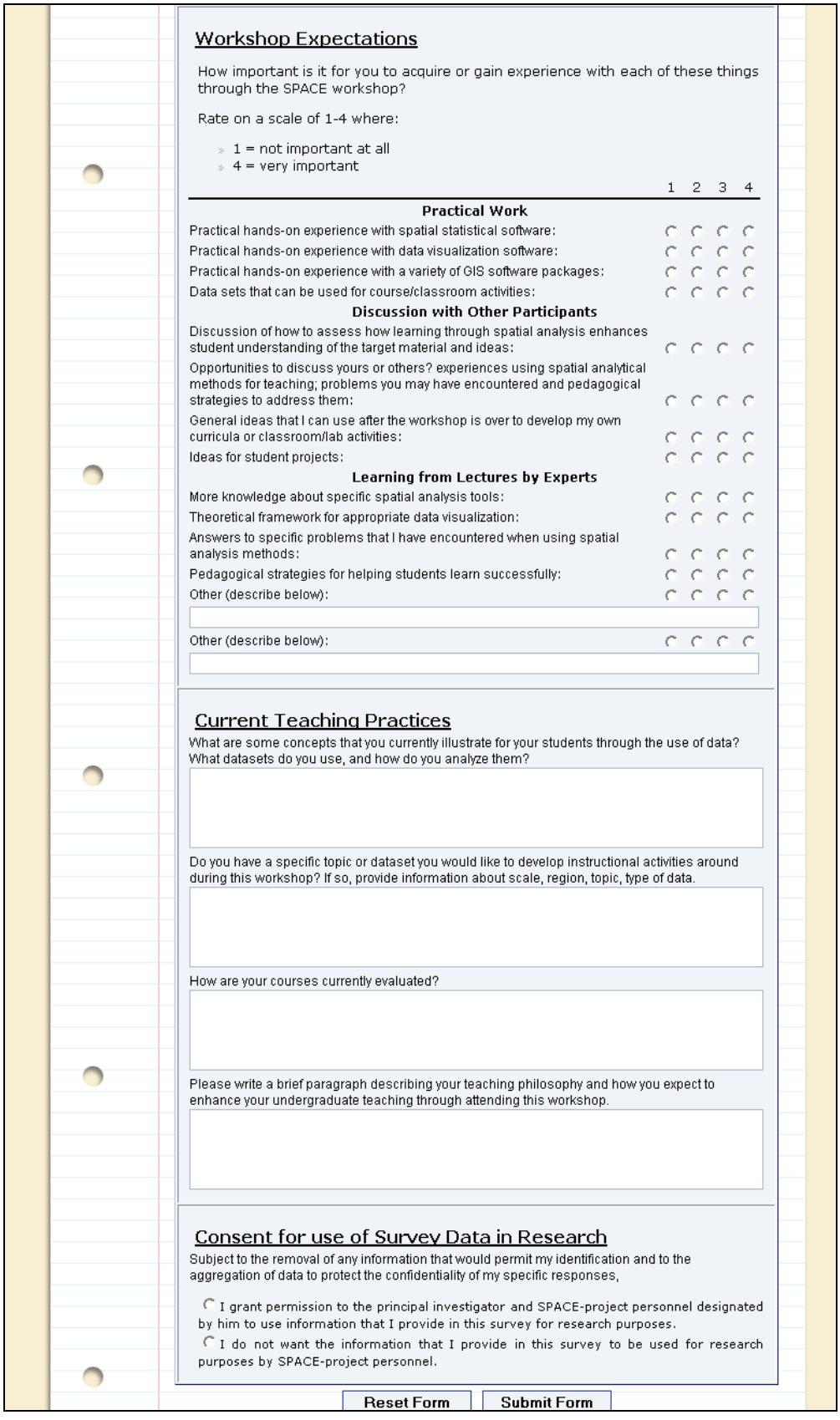
Barriers to Spatial Approaches

To what degree are the following issues obstacles for you in teaching spatial approaches to undergraduates in the social sciences? If you see additional barriers to the use of spatial methods in undergraduate social science education, please add them in the available spaces.

Rate on a scale of 1-4 where:

- 1 = not an obstacle at all
- 4 = very significant obstacle

	1	2	3	4
Limited knowledge of appropriate pedagogical strategies:				
Lack of experience with GIS and spatial analysis tools:				
Inaccessibility of necessary data:				
Inadequate access to necessary software/facilities:				
Lack of technical support for spatial analysis tools at my institution:				
Lack of student readiness to grasp the concepts behind spatial analysis:				
Other (describe below):				
Other (describe below):				



Workshop Expectations

How important is it for you to acquire or gain experience with each of these things through the SPACE workshop?

Rate on a scale of 1-4 where:

- 1 = not important at all
- 4 = very important

	1	2	3	4
Practical Work				
Practical hands-on experience with spatial statistical software:	○	○	○	○
Practical hands-on experience with data visualization software:	○	○	○	○
Practical hands-on experience with a variety of GIS software packages:	○	○	○	○
Data sets that can be used for course/classroom activities:	○	○	○	○
Discussion with Other Participants				
Discussion of how to assess how learning through spatial analysis enhances student understanding of the target material and ideas:	○	○	○	○
Opportunities to discuss yours or others? experiences using spatial analytical methods for teaching; problems you may have encountered and pedagogical strategies to address them:	○	○	○	○
General ideas that I can use after the workshop is over to develop my own curricula or classroom/lab activities:	○	○	○	○
Ideas for student projects:	○	○	○	○
Learning from Lectures by Experts				
More knowledge about specific spatial analysis tools:	○	○	○	○
Theoretical framework for appropriate data visualization:	○	○	○	○
Answers to specific problems that I have encountered when using spatial analysis methods:	○	○	○	○
Pedagogical strategies for helping students learn successfully:	○	○	○	○
Other (describe below):	○	○	○	○
Other (describe below):	○	○	○	○

Current Teaching Practices

What are some concepts that you currently illustrate for your students through the use of data? What datasets do you use, and how do you analyze them?

Do you have a specific topic or dataset you would like to develop instructional activities around during this workshop? If so, provide information about scale, region, topic, type of data.

How are your courses currently evaluated?

Please write a brief paragraph describing your teaching philosophy and how you expect to enhance your undergraduate teaching through attending this workshop.

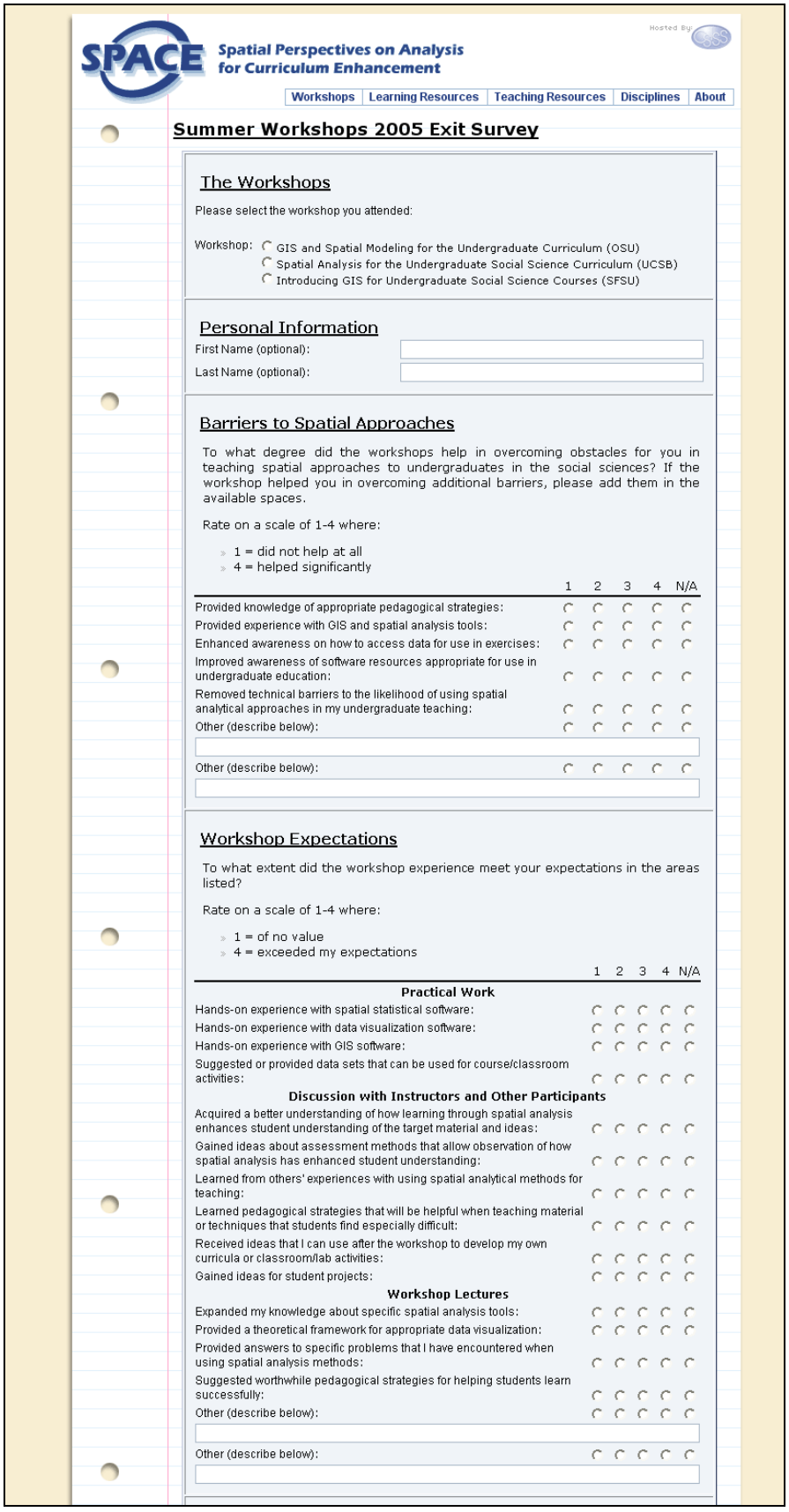
Consent for use of Survey Data in Research

Subject to the removal of any information that would permit my identification and to the aggregation of data to protect the confidentiality of my specific responses,

○ I grant permission to the principal investigator and SPACE-project personnel designated by him to use information that I provide in this survey for research purposes.

○ I do not want the information that I provide in this survey to be used for research purposes by SPACE-project personnel.

Reset Form Submit Form



SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Hosted By CSISS

Workshops | Learning Resources | Teaching Resources | Disciplines | About

Summer Workshops 2005 Exit Survey

The Workshops

Please select the workshop you attended:

Workshop:
- GIS and Spatial Modeling for the Undergraduate Curriculum (OSU)
- Spatial Analysis for the Undergraduate Social Science Curriculum (UCSB)
- Introducing GIS for Undergraduate Social Science Courses (SFSU)

Personal Information

First Name (optional):

Last Name (optional):

Barriers to Spatial Approaches

To what degree did the workshops help in overcoming obstacles for you in teaching spatial approaches to undergraduates in the social sciences? If the workshop helped you in overcoming additional barriers, please add them in the available spaces.

Rate on a scale of 1-4 where:

- 1 = did not help at all
- 4 = helped significantly

	1	2	3	4	N/A
Provided knowledge of appropriate pedagogical strategies:	○	○	○	○	○
Provided experience with GIS and spatial analysis tools:	○	○	○	○	○
Enhanced awareness on how to access data for use in exercises:	○	○	○	○	○
Improved awareness of software resources appropriate for use in undergraduate education:	○	○	○	○	○
Removed technical barriers to the likelihood of using spatial analytical approaches in my undergraduate teaching:	○	○	○	○	○
Other (describe below):	○	○	○	○	○
Other (describe below):	○	○	○	○	○

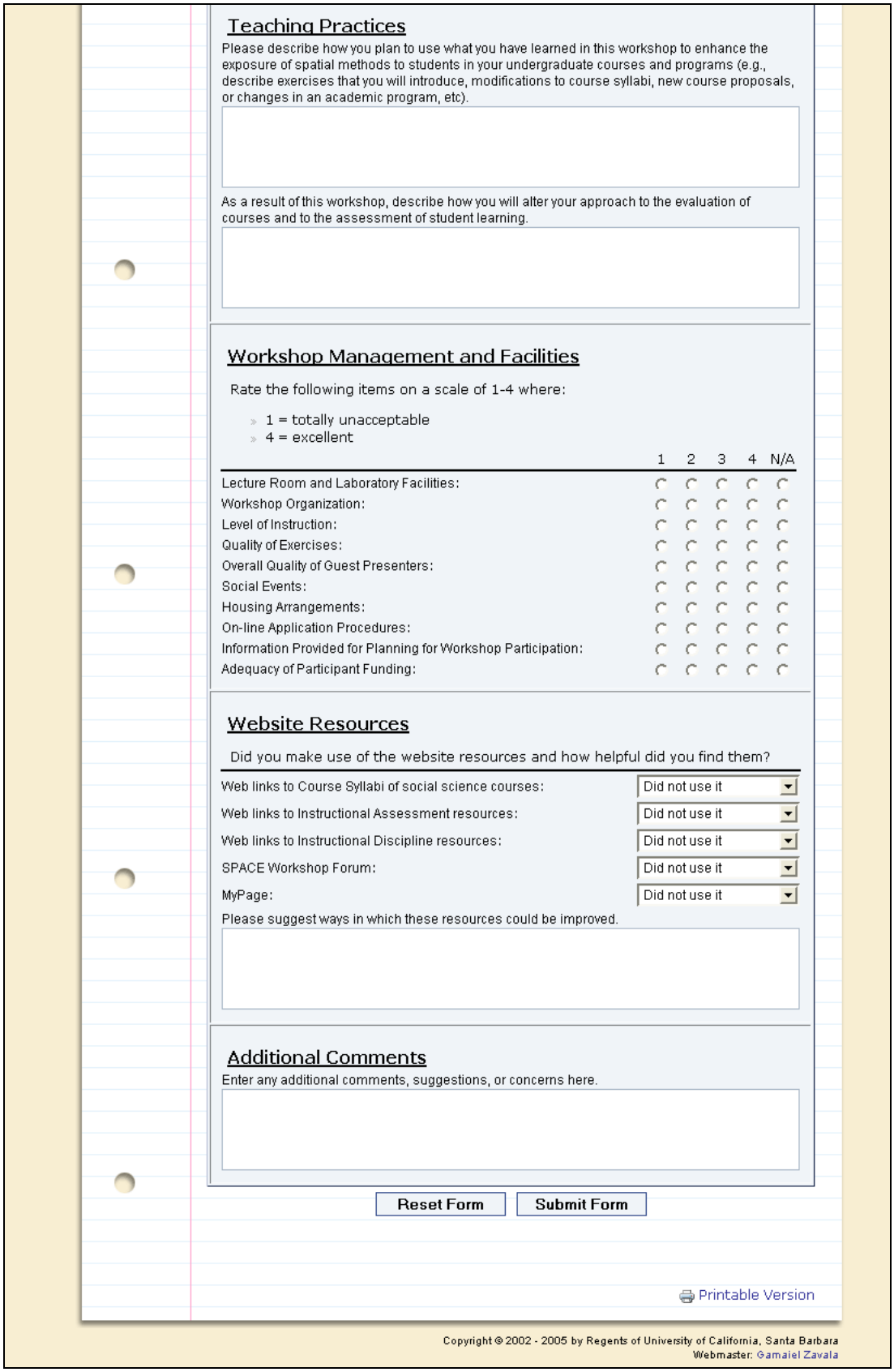
Workshop Expectations

To what extent did the workshop experience meet your expectations in the areas listed?

Rate on a scale of 1-4 where:

- 1 = of no value
- 4 = exceeded my expectations

	1	2	3	4	N/A
Practical Work					
Hands-on experience with spatial statistical software:	○	○	○	○	○
Hands-on experience with data visualization software:	○	○	○	○	○
Hands-on experience with GIS software:	○	○	○	○	○
Suggested or provided data sets that can be used for course/classroom activities:	○	○	○	○	○
Discussion with Instructors and Other Participants					
Acquired a better understanding of how learning through spatial analysis enhances student understanding of the target material and ideas:	○	○	○	○	○
Gained ideas about assessment methods that allow observation of how spatial analysis has enhanced student understanding:	○	○	○	○	○
Learned from others' experiences with using spatial analytical methods for teaching:	○	○	○	○	○
Learned pedagogical strategies that will be helpful when teaching material or techniques that students find especially difficult:	○	○	○	○	○
Received ideas that I can use after the workshop to develop my own curricula or classroom/lab activities:	○	○	○	○	○
Gained ideas for student projects:	○	○	○	○	○
Workshop Lectures					
Expanded my knowledge about specific spatial analysis tools:	○	○	○	○	○
Provided a theoretical framework for appropriate data visualization:	○	○	○	○	○
Provided answers to specific problems that I have encountered when using spatial analysis methods:	○	○	○	○	○
Suggested worthwhile pedagogical strategies for helping students learn successfully:	○	○	○	○	○
Other (describe below):	○	○	○	○	○
Other (describe below):	○	○	○	○	○



Teaching Practices

Please describe how you plan to use what you have learned in this workshop to enhance the exposure of spatial methods to students in your undergraduate courses and programs (e.g., describe exercises that you will introduce, modifications to course syllabi, new course proposals, or changes in an academic program, etc).

As a result of this workshop, describe how you will alter your approach to the evaluation of courses and to the assessment of student learning.

Workshop Management and Facilities

Rate the following items on a scale of 1-4 where:

- 1 = totally unacceptable
- 4 = excellent

	1	2	3	4	N/A
Lecture Room and Laboratory Facilities:	○	○	○	○	○
Workshop Organization:	○	○	○	○	○
Level of Instruction:	○	○	○	○	○
Quality of Exercises:	○	○	○	○	○
Overall Quality of Guest Presenters:	○	○	○	○	○
Social Events:	○	○	○	○	○
Housing Arrangements:	○	○	○	○	○
On-line Application Procedures:	○	○	○	○	○
Information Provided for Planning for Workshop Participation:	○	○	○	○	○
Adequacy of Participant Funding:	○	○	○	○	○

Website Resources

Did you make use of the website resources and how helpful did you find them?

Web links to Course Syllabi of social science courses:	Did not use it
Web links to Instructional Assessment resources:	Did not use it
Web links to Instructional Discipline resources:	Did not use it
SPACE Workshop Forum:	Did not use it
MyPage:	Did not use it

Please suggest ways in which these resources could be improved.

Additional Comments

Enter any additional comments, suggestions, or concerns here.

Reset Form Submit Form

Printable Version

III. RESULTS FROM APPLICATION / ENTRY / EXIT SURVEYS

The results from the quantitative questions on the entry and exit surveys (scaled values from 1 to 4 or 1 to 5) were depicted on radial graphs as average values for each of the three workshops (and in tabular format. The tables appear in this report and the radial graphs will be included in a report for distribution over the Web and for meeting requests from the scientific and educational communities. In addition, data from the application survey show the self-assessed pre-workshop mastery of spatial analytic skills and curricula development background, stratified by gender for those who were accepted and not accepted into the workshops. Low average values may suggest aspects of workshop structure or implementation that need further consideration. Additional data and graphic representations of these data will be reviewed at the SPACE planning meeting in December 2005 and will figure prominently in structuring the program for summer 2006 workshops.

In the **participant self-assessments from the application form**, key observations include:

- Male applicants were more confident than female applicants of their skill levels, although these differences were more apparent for the "Not Admitted" applicants than for those who actually attended the workshops.
- Among actual participants, the average values for the OSU and UCSB workshops were similar and those for SFSU participants were significantly lower. This reflects a deliberate strategy to acquaint applicants with the content and expected skill levels for each workshop – information made conspicuous on the website. The SFSU workshop targeted those with novice background in spatial analysis.
- Although general quantitative skills were similar for participants at OSU and UCSB, the OSU workshop catered more explicitly to those with significant prior background in GIS or in analytical geography. In contrast, the UCSB workshop attracted a broader range of social scientists, many with interests in introducing their students to spatial econometric approaches tailored to their own disciplines.

In the **entry surveys**, we tried to gauge the **perceived barriers and expectations** of participants, so that workshop instructors could be responsive to their needs. Key observations follow:

- In general, entering participants minimize the significance of barriers. One exception was the "experience barrier" in GIS for SFSU participants, reflecting clearly the reason why they chose a workshop focused largely on entry-level GIS.
- Across the board, expectations were high for skill development in techniques and for pedagogical insights.
- Participants at OSU and UCSB (more skilled in GIS than the SFSU counterparts) were looking beyond GIS, seeking new skills in data visualization and spatial statistics.

Our initial interpretations of ratings from the exit surveys suggest:

- Average ratings increased for the OSU and UCSB workshops in 2005 over those in 2004. Instructional teams had the advantage of responding to problems observed in the 2004 workshops, adjusting the content and approaches to instruction accordingly.
- Lower average values for the SFSU workshop reflect the high entry-level expectations from novice participants. The entry-level GIS concentration at SFSU would naturally lead to lower ratings for other technical areas and for pedagogical concentration.

APPLICANT SELF-ASSESSMENT FOR 2005 SPACE WORKSHOPS

Applicants' Self Assessment of Spatial Analytic Experience 2005 (Average Values -- See Application)

Experience				Not Admitted		Accepted	
Indicators	UCSB	OSU	SFSU	Female	Male	Female	Male
Spatial Thought	3.41	3.46	2.73	2.43	3.32	3.07	3.32
Cartography	2.91	3.00	2.05	2.14	2.96	2.45	2.82
Data Management	3.95	3.83	2.86	3.57	3.32	3.52	3.58
Internet Search	4.18	4.13	3.50	4.00	3.52	4.17	3.76
Visualization	3.45	3.50	2.36	3.57	3.16	2.93	3.26
Qualitative	3.36	2.63	3.77	3.71	2.84	3.34	3.13
Quantitative	3.68	3.46	2.86	3.14	3.12	3.24	3.37
Curriculum	3.18	2.79	3.59	3.29	3.08	3.24	3.13
GIS	3.36	3.33	2.00	2.57	3.08	2.83	3.00
Spatial Statistics	2.59	2.92	1.77	1.86	2.72	2.28	2.58
Geo-coding	2.50	2.83	1.55	1.71	2.76	2.10	2.47
GPS	2.45	2.88	1.77	2.14	2.68	2.28	2.47
Remote Sensing	2.14	2.33	1.32	1.86	2.48	1.93	1.97

WHAT DID THOSE ACCEPTED INTO 2005 SPACE WORKSHOPS PERCEIVE AS BARRIERS AND EXPECT AS WORKSHOP OUTCOMES?

Perceived Barriers to Spatial Analysis in Undergraduate Education and Expectations for SPACE Workshops by Participants (Averages on 1 to 4 scaling – See Entry Survey)

Year 2005	Averages by Workshop		
BARRIERS:	**UCSB**	**OSU**	**SFSU**
Pedagogical Knowledge	2.64	2.68	2.52
GIS Experience	2.50	2.36	3.48
Data Access	2.09	2.18	2.29
Software Access	2.18	1.86	1.86
Technical Support	2.55	2.18	2.29
Student Readiness	2.55	2.59	2.43
WORKSHOP EXPECTATIONS:			
Spatial Statistics	3.68	3.68	3.33
Data Visualization	3.50	3.55	3.71
GIS Software Use	2.73	2.95	3.62
Data for Classes	3.50	3.50	3.43
EXPECTATIONS FROM DISCUSSION WITH OTHER PARTICIPANTS:			
Student Learning Assessment	3.36	3.23	3.24
Strategies for Teaching	3.27	2.86	2.90
Curricula/Class Activities	3.55	3.45	3.71
Discuss Student Projects	3.23	3.50	3.38
EXPECTATIONS FROM WORKSHOP INSTRUCTORS:			
Spatial Analysis Tools	3.64	3.73	3.62
Data Visualization Theory	3.41	3.50	3.29
Answers to Problems in Spatial Analysis	2.45	2.36	2.29
Learn Pedagogical Strategies	3.55	3.50	3.38

HOW DID SPACE WORKSHOP PARTICIPANTS RATE THE 2005 SPACE WORKSHOPS?

Based on 1 to 4 Scaling of Questions on the Exit Surveys

Workshop:	UCSB	OSU	SFSU
REMOVED BARRIERS IN:			
Knowledge	3.67	3.18	2.79
GIS	3.73	3.23	3.37
Data Access	3.29	3.14	3.21
Software Use	3.73	3.64	3.26
Spatial Teaching	3.64	2.91	2.84
MET EXPECTATIONS IN:			
Spatial Statistics	3.57	2.82	2.88
Data Visualization	3.55	2.50	2.82
GIS	3.68	2.77	3.05
Data for Classes	3.14	2.82	2.89
GAINED IDEAS FORM DISCUSSIONS ABOUT:			
Student Learning	3.68	3.41	2.89
Assessment of Student Learning	3.45	3.14	2.82
Spatial Methods for Teaching	3.91	3.41	2.95
Pedagogical Strategies	3.59	3.32	2.42
Developing Curricula	3.82	3.45	3.00
Student Projects	3.64	3.41	2.95
FROM INSTRUCTORS:			
Expanded Knowledge of Spatial Tools	3.73	3.36	3.37
Learned Theory of Data Visualization	3.50	3.23	2.83
Answered Problems in Spatial Analysis	3.35	3.14	2.93
Learned Strategies to Help Students	3.59	3.32	2.56
QUALITY ASSESSMENT:			
Workshop Lab Facilities	3.76	3.77	3.67
Workshop Organization	3.77	3.68	3.39
Level of Instruction	3.95	3.55	3.41
Exercises	3.55	3.55	3.17
Guest Presenters	3.81	3.77	3.44
Social Events	3.75	3.64	2.87
Housing	3.74	2.77	2.25
On-line Application	4.00	3.82	3.61
Pre-workshop Information	3.70	3.18	3.06
Adequacy of Funding	3.74	3.55	3.69

IV. COMMENTARY BY 2005 WORKSHOP AND EDUCATIONAL DEVELOPMENT COORDINATORS

OSU SPACE Workshop Report

Mei-Po Kwan, Workshop Coordinator

Overview and Goals

Funded by a grant from the Center for Spatially Integrated Social Science (CSISS), the Department of Geography at Ohio State University conducted a workshop on Spatial Perspectives on Analysis for Curriculum Enhancement (SPACE) during the period July 10 to July 15, 2005. The PI was Mei-Po Kwan, professor of geography at OSU.

The 24 participants were primarily faculty members in the social sciences from a variety of large and small universities and colleges in the United States. The following disciplines were represented: anthropology, economics, public health, urban and regional planning, urban studies, geography, sociology, and regional science.

The goal of the OSU workshop was to provide participating social scientists with tools and concepts for spatial thinking and analysis that can be used in their teaching. The workshop also targeted social scientists who have a methodological focus. Selection criteria included whether the applicant has a strong potential to incorporate spatial analysis and techniques in their teaching. All participants have some knowledge in GIS and spatial analysis.

The workshop also aims to provide participants with a set of tools/exercises that can be readily incorporated into their teaching. Based on the examples illustrated in the workshop, participants also developed their own example for their discipline. They also worked on their own projects with a focus on education and professional development.

The Instructors

The core instructional Team (Kwan, Murray, O'Kelly, Tiefelsdorf, and Xiao) introduced spatial concepts on important ideas like spatial interaction, spatial pattern analysis, space-time analysis, spatial optimization, and spatial analysis of census data. The core instructors used lectures to introduce spatial concepts and techniques, utilized discussion to address how they are useful to the participants' courses, and lab exercises to provide examples for use in their classes.

Guest lecturers: Four guest lecturers (Brown, Lobao, McLafferty, and Shaw) who specialize in different application areas were invited to give presentations in the workshop - for example, health-related issues, societal issues, historical issues, and economic development and transportation issues. The lecturers provided practical examples on using spatial concepts and techniques in teaching.

Pedagogies: The Associate Director of the Office of Faculty and TA Development at OSU, Kathryn Plank, provided a pedagogical session on "How students learn." In 2005, she added another pedagogical session on "Planning and assessing students' learning." She also helped with many group discussions on pedagogy and on group projects by participants.

A group of graduate students (VanHorn, Klaf, Ding, and Davis) also helped with lab sessions and workshop logistics.

The Agenda and Workshop Activities
For 2005, the workshop was extended to six full days to accommodate the differences in spatial analytical skills. In summary, the first day was devoted to setting workshop goals, for pedagogical orientation, and for refreshing GIS skills. The next four days were devoted to lectures, lab sessions, guest lectures, and pedagogy sessions. They last day was devoted to the presentation of participants' projects. Social activities included one BBQ dinner in the department and one dinner in a local restaurant. Receptions were held before the dinners.

The agenda is listed in the "Activities" section.

The Participants
Twenty-four participants (see list under "Activities") were able to join the workshop. Each participant was asked to work on a group project related to what they learned from the workshop and how to apply it in their own teaching. The last day (Day 6) was devoted to the presentation of these projects by the participants.

The titles of the group projects presented at Day 6:

- Space-Time Analysis in Undergraduate Education (Nairne Cameron, Rajrani Kalra, Kevin Leander, Shouraseni Sen Roy and Talar Sahsuvaroglu)
- Understanding Residential Patterns Using Census Data (Adegoke Ademiluyi, Samuel Adu-Prah, Chris Cusack, Lynn Harvey, Sunwoong Kim)
- **Teaching Elements in GIS and Spatial Optimization Modeling (Yuri Gorokhovich, Sun Park, Alexander Prishchepov, Stephen Truhon and Karin Pfeffer)**
  Spatial Interaction Modeling and Undergraduate Classes (Jiyeong Lee, Jinmu Choi, and Julio Rivera)
- Using Spatial Pattern Analysis (Bernadette De Leon, Clara Popa, Jungyul Sohn, Cecile N. Yancu, and Li Yin)

The Facilities
OSU Geography has contributed a teaching laboratory with 50 PCs running all the GIS and statistical software needed for the workshop. This software includes ESRI software (ArcGIS, ArcView), GeoDa, TransCAD, SPSS, GeoMedia, IDRISI, and others. The department has also reserved two additional teaching laboratories with about 10 seats of computers and three classrooms (including one classroom with a capacity of 75, and two seminar rooms) exclusively for the workshop. The departmental Xerox and fax machines were also available for the workshop participants.

Resources Disseminated in the Workshop
The following instructional resources were disseminated in the workshop:

- PowerPoint presentations of all lectures
- Reading materials related to lectures and pedagogy sessions
- All lab exercises used in lab sessions
- A CD copy of the free software GeoDa
- A copy of the book "Spatially Integrated Social Science" edited by Michael F. Goodchild and Donald G. Janelle
- A copy of "An Atlas of Poverty in America" by Amy K. Glasmeier

The PI's Evaluation of the OSU SPACE Workshop
Overall, the quality of the participants and instructors are very high. See Findings, Section III.

For 2005, we added one more day to the workshop. More time was devoted to refreshing and learning GIS software on the first day. We also added more time and sessions on pedagogy from Plank. This facilitated the development of the participants' teaching skills. However, the participants were scheduled to work extensively on one of the lab sessions among the five major topics. Most participants expressed interest in working on at least two of lab sessions on the major topics. As such, the planned workshop for 2006 can be improved by allowing the participants to work on two or more lab session(s) on the major topics. In view of the popularity of the software GeoDa, we plan to add some extra sessions on this software so that the participants can become familiar with the software. This will facilitate their learning of the materials in the workshop and applications of spatial analysis in their teaching.

San Francisco State University SPACE Workshop Report

On Behalf of the University Consortium for Geographic Information Science
Richard LeGates, SFSU Workshop Coordinator

Introduction and Summary:
Funded by a contract from the Center for Spatially Integrated Social Science (CSISS), the University Consortium for Geographic Information Science (UCGIS) conducted a SPACE workshop at San Francisco State University (SFSU) during the period July 31 – August 6, 2005. The PIs were Richard LeGates and XiaoHang Liu. LeGates is a professor of Urban Studies at SFSU; Liu is an assistant professor of Geography at SFSU.

There were twenty-one workshop participants: nineteen faculty members in the social sciences and two Ph.D. candidates who are already teaching in the social sciences. The following disciplines were represented: geography, sociology, political science, economics, anthropology, history, archeology, urban and regional planning, environmental studies, Black studies, demography, and social work.

Workshop instructors were from San Francisco State University (Richard LeGates, XiaoHang Liu, Ayse Pamuk, and Barry Nickel) supplemented by visitors from U.C. Santa Barbara (Donald Janelle, Keith Clarke, and Stacey Rebich).

Students from the SFSU Geography and Film departments, and the Urban Studies Program assisted with workshop logistics.

The Environmental Science Research Institute (ESRI) provided free demo copies of ArcGIS 9.0 software for each participant and made available a library of ESRI Press books that was available to workshop participants during the workshop. CSISS provided each workshop participant a copy of Michael Goodchild and Donald Janelle's *Spatially Integrated Social Science* (London and New York: Oxford University press 2004).

The workshop agenda included lectures by LeGates, Liu, Nickel, Pamuk, Janelle, Clarke, and Rebich; laboratory exercises directed by LeGates, Liu, Nickel, and Pamuk; activities related to pedagogy, assessment, and curriculum design directed by Rebich; discussion sessions; and unstructured computer lab time with instructor support. Social activities consisted of an opening reception and a walking tour of San Francisco's South of Market district led by SFSU Geography professor Max Kirkeberg.

A reading of the exit survey forms indicates that participants accomplished a great deal during the week, that the end-of-week workshop objectives were met, and that the workshop provided an enjoyable and useful series of activities. Workshop participants warmly praised the instructors and staff and the workshop instructors were very pleased with the high academic quality and motivation of the workshop participants.

Overview of the SFSU Workshop Experience:
The workshop provided faculty teaching undergraduate social science courses an introduction to GIS and spatial analysis. The workshop emphasized ways in which GIS and spatial thinking could be incorporated into the types of courses workshop participants teach. About an equal amount of time during the workshop was devoted to teaching GIS concepts and GIS operations. The workshop introduced good pedagogical practice early on and concluded with a discussion of how participants plan to incorporate what they learned into their courses. It also included material on how to assess learning outcomes in course material related to spatial thinking. Workshop participants collaborated on brainstorming how to incorporate what they learn into their courses. One member of the workshop chaired the concluding session summarizing this material.

The participants and the workshop agenda are listed in the "Activities" section of this report. Workshop participants were diverse in terms of the location and type of academic institution, academic rank, age, gender, and race. Most participants had no prior experience with GIS—though several had once been conversant with GIS, had taken short courses, or had taught themselves some GIS.

Facilities:
SFSU's Geography Department and Institute for Geographic Information Science provided infrastructure support. The workshop was taught in the Geography Departments GIS classroom (HSS 290): a state-of-the-art facility with the appropriate software licenses, individual working areas, powerful computers for each participant, an overhead projection system, and comfortable and discussion space. On-campus housing was made available by SFSU in apartments and dormitories. The lending library of ESRI Press books was housed in the Geography Department map library immediately adjacent to the teaching laboratory. The workshop reception was held in the Blakeslee room—a university facility often used for this purpose.

Other resources:
The workshop drew on CSISS/SPACE web resources and web resources developed by SFSU's Institute for Geographic Information Science. The introductory lecture of the workshop, by Donald Janelle, provided participants with an overview of teaching and learning resources available for spatially integrated social science and a session on the last day of the workshop by Barry Nickel and Richard LeGates discussed additional resources.

The Agenda: See the “Activities” section of this report.

Plans for follow up:
As a workshop targeted to beginners, this workshop is less likely to produce truly innovative curriculum materials than the more advanced workshops taught at U.C. Santa Barbara and Ohio State University. The nature of the innovation is most likely to be faculty moving from no material on spatial thinking and no use of GIS in their courses to some elementary use of this material. The workshop participants are a talented and motivated group with a wide range of interests and experiences. How they use workshop concepts and materials in different institutional contexts should be of interest to NSF, CSISS, and us to understand better the diffusion of spatial thinking and GIS knowledge.

UCGIS has agreed to provide funds to bring the workshop principal investigator and co-principal investigator (Richard LeGates and XiaoHang Liu) and approximately three or four workshop participants to the summer 2006 UCGIS workshop. LeGates and Liu plan to spend approximately half an hour describing the SFSU/SPACE workshop, show a short (8 minute) video of the workshop, have each of the workshop participants describe their experience in the workshop, and describe how they incorporated material from the workshop into their teaching.

Richard LeGates and Stuart Sweeney, supported by ACCESS-program funding from SPACE, will attend the fall 2005 conference of the Association of Collegiate School of Planning (ACSP) where they will describe spatially-integrated social science and the CSISS/SPACE approach to disseminating spatial thinking to the ACSP computer users group and to conference participants (primarily professors of city and regional planning) who do not presently use GIS in their teaching. LeGates, Sweeney, Ayse Pamuk, and Brian Paar (co-author of an ESRI Press book on use of GIS in Urban Planning) will be available to conference participants to demo the exercises used in the SPACE workshops and related material.

All workshop participants have been encouraged to apply for SPACE incentive grants to further their work in incorporating spatial thinking and GIS into their coursework. The final activity of the workshop

involved a participant-led discussion of how they plan to use the workshop material. Participants have exchanged e-mail addresses and will be in contact with each other. It is too early to predict precisely what the outcome of this post-workshop activity will be.

Richard LeGates and Ayse Pamuk have independent NSF funding from a CCLI-EMD grant, which will allow them to make up to six conference presentations to social scientists during the coming year. References to the SFSU/SPACE workshop should figure prominently in these presentations.

The Santa Barbara SPACE Workshop

Fiona Goodchild, SPACE Education Development Coordinator

Modification of Workshop Pedagogy:
All three SPACE summer institutes for 2005 were modified as result of the evaluation findings in summer 2004. A major change was the decision that each of the three workshops would have the same time frame of 6 days. This decision was made so that it would be easier to differentiate the focus for each of the workshops and recruit based on the nature of the workshop rather than the time frame.

As a result, the workshop at UC Santa Barbara was shorter than the previous 10 days.
The target audience was social science faculty who already had some experience in using GIS, either in their research or their teaching. In 2004, by contrast, the UCSB workshop recruited novices to spatial thinking and GIS. In 2005, the selection of participants aimed to create representation from a range of disciplines and teaching expertise.

Fiona Goodchild and Stacy Rebich adapted the pedagogy component to meet the needs that participants expressed in the pre-workshop surveys. It was clear from these surveys that about half of the participants had already introduced some spatial analysis in courses at their home institutions. Some had more than 10 years experience for example. The workshop set up early opportunities for sharing previous experiences and expertise, especially in terms of curriculum development and assessment. The workshop also aimed to introduce the participants to relevant cognitive theories about spatial learning in the expectation that these would guide the design of the participant presentations on the final day of the workshop.

Pedagogical Exchange:

1. On the first afternoon, the participants held *small group discussions* about their teaching philosophy and approach. Participants used a prepared list of questions to guide these discussions: see Findings, Section V. All workshop instructors sat in on one of these group discussions and gathered feedback about individual interests and concerns.
2. On the first evening, at an introductory reception, all participants displayed posters that reflected their teaching interests, ranging from a series of courses that formed a complete program or curriculum to a specific exercise that introduced students to the use of a spatial database.
3. Later in the week, Panel on Teaching Spatial Analysis provided an opportunity for all participants to ask questions of experienced instructors, three from Santa Barbara, and three participants, Claude Barnes, Brian Lee, and Diana Sinton.
4. On the final day, all participants made a short presentation about the innovation that they planned to implement in their courses in the immediate academic year.

This focus on exchange generated much enthusiasm, exemplified in one comment:

I liked seeing the range of participant presentations particularly b/c it gave me additional ideas that were at my level about how to incorporate spatial data and analysis into my courses.

Presentations on Pedagogy:
During the first pedagogy session on the first day of the workshop, two major concepts were discussed:

Prior Knowledge
Fiona Goodchild discussed research on the influence of prior knowledge and suggested strategies for collecting data on the entry-level knowledge of students. When she asked participants to articulate the planning requirements for any new course, few of them stated that they conducted any kind of survey of the prior knowledge possessed by the students who were starting the course. One or two did already have

an online method for conducting pre-lecture tests and for surveying students about general goals and interests.

Though some of the faculty believed they could estimate content knowledge based on prerequisite courses, they did not make a specific effort to gauge computer or analytical skills. Clearly, the lack of information on incoming knowledge and performance makes it more difficult to identify what students gain from the course.

Assessment of Student Learning

The second pedagogy session addressed the issues of course evaluation and learning assessment, a topic that many participants identified as a concern in the pre-workshop survey. Stacy Rebich presented ideas on how to conduct in-class surveys and brief assessments that provide feedback on student progress. She also discussed the match between course objectives and instruction with the final performance assessment of student achievement.

Several of the participants were able to provide ideas on how they had used different methods of assessing student work – from short exercises in class to individual projects, to group work with local community agencies.

Another topic for discussion was how to guide students as they developed portfolios of their work, both to satisfy course requirements and for use in future careers.

The PowerPoint slides for both of these presentations were posted on the course website.

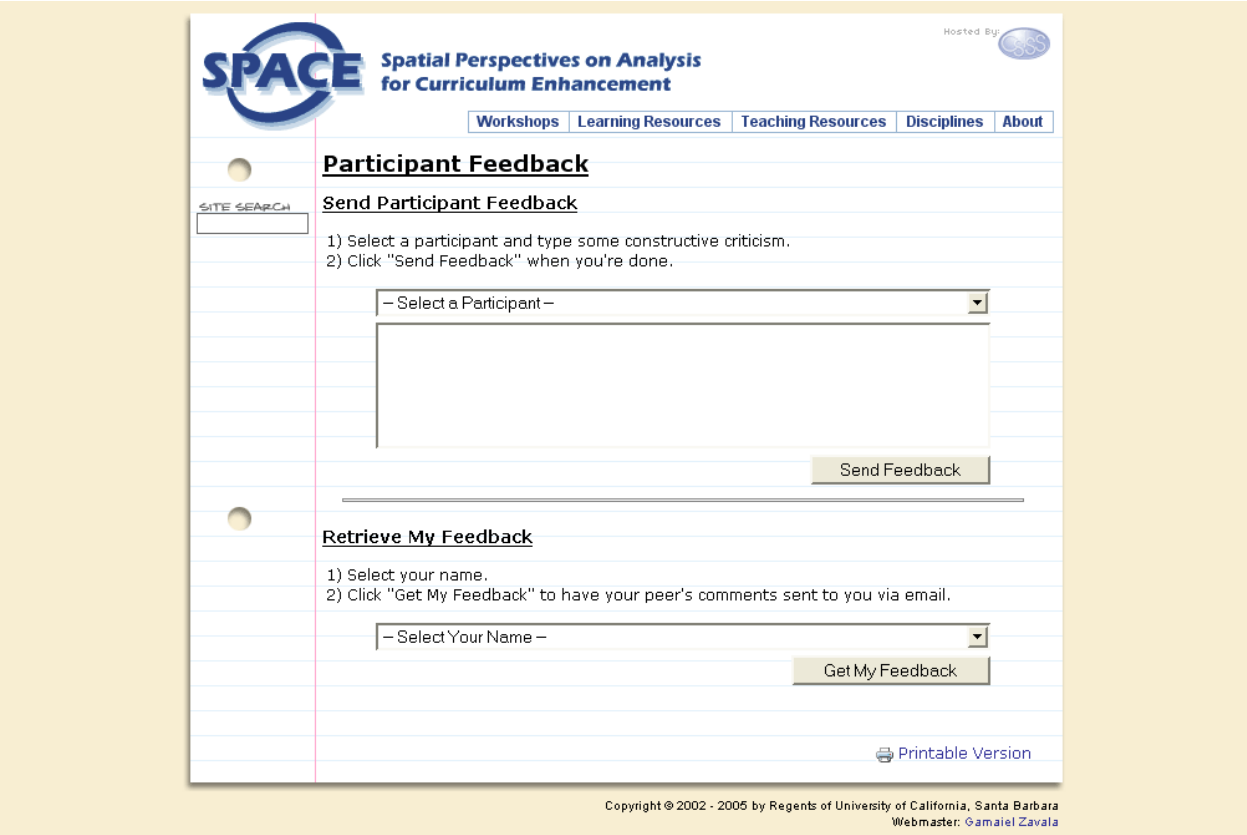
Practical Laboratory Exercises:

After reviewing the feedback from the 2004 workshop, we put care into planning laboratory exercises that would meet the needs of both novice and experienced users of GIS. For the first exercise, the participants were paired so that one had more experience than the other did. The graduate student teaching assistants prepared exercises that had enough challenge and at the same time offered a reasonable starting point for less experienced participants. These appeared to offer enough variety and novelty, especially in terms of how to introduce spatial analysis and its tools into traditional courses where students are never exposed to GIS skills. For example, one of the more experienced participants commented:

I really liked the idea of having the goal of an assignment being the collation of data from various sources into a single data set. A lot of times, the creation of the dataset is treated as unproblematic, despite the fact that it is a very difficult part of most projects.

Real Time review of presentations:

A new feature of the workshop allowed participants to provide real-time feedback to their colleagues about the strengths and weaknesses of the presentations that they made on the final day. This provided a comprehensive set of comments and suggestions to each of the participants. This procedure was Web-based — participants had access to a custom-designed web entry form (see form, below). Using wireless access from their laptops, they could make entries simultaneously for each presentation. Presenters would then receive an email with 10 or more submissions on their presentation. Peer reviewers were anonymous, unless they revealed their names.



How did participant exit surveys indicate that the new format met their interests?

The chart below indicates the percentage of participants who gave the highest rating to the following statements in their exit surveys.

Learned from others' experiences with using spatial analytical methods for teaching -100%

Learned pedagogical strategies that will be helpful when teaching material or techniques that students find especially difficult – 80%

Received ideas that I can use after the workshop to develop my own curricula or classroom/lab activities – 100%

The following comments also reflected participant satisfaction.

Great faculty--knowledgeable, friendly, helpful--willing to explore ideas with the participants. Faculty and staff made themselves available outside of classroom and labs so we could get to know them personally and ask questions in a more informal environment. Well organized workshop and well paced. Motivating and enlightening. Absolutely great experience.

After having taught full time for 9 years and part time for the 10 years before that I was getting, to say the least, jaded. The ideas that I've picked up at the workshop and the references that I'm pouring over now promise to give me the boost that I've been looking for - thanks!

I truly appreciate the opportunity to take part in this workshop. It was a fabulous and helpful experience. The faculty are excellent as professionals, as scholars, and in the ways they imparted their knowledge and experience. The TA's were very helpful and cheerful too. Learning from other participants was a highlight as well. And we were well taken care of. I wish it could have been for 2 weeks because I felt there was not enough time to do all the exercises and practice newly learned software and techniques and still be prepared for the presentations, and to have something completed to take back to my classroom. Yet I still came back with much more knowledge and new skills I am looking forward to applying in the classroom and in research.

UCSB *SPACE* Workshop Presentations – Saturday 23 July 2005

9:00 Moderator, **Stuart Sweeney**
9:05 Peer Assessment Process, **Fiona Goodchild** and **Don Janelle**

9:15 – 10:30

Integrating Spatial Perspectives in Lectures and Labs

Kevin Marsh (Idaho State University) Spatial Dimensions and Perceptions of Idaho Irrigation Communities, 1900 – 1945

Claude Barnes (North Carolina A&T State University) Race, Politics, and Redistricting in North Carolina

Randolph Horn (Samford University) Redistricting Labs in Political Science

Owen Dwyer (Indiana University at Indianapolis) Exploring the Social Geography of Civil Rights Tourism

Joe Francis (Cornell University) and **Diana Sinton** (Middlebury College) Can We Trust ESRI?

10:45 – 11:45

Introducing Spatial Perspectives in Curriculum and Course Design

Brian Lee (University of Kentucky) A Curriculum Sequence for Landscape Analysis and Planning

Kurt Fuellhart (Shippensburg University) Incorporating Spatial Analysis Options in Economic Geography and Quantitative Methods

Sung Chun (University of Notre Dame) Integrating Sociological Research Using Spatial Concepts in Sociology and Area Courses

Mary Lou Larson (University of Wyoming) Redesign of GIS in Anthropology

1:00 – 2:15

Using Spatial Methods to Introduce Regional and Global Perspectives in Undergraduate Teaching

Judith van der Elst and **Heather Richards** (University of New Mexico) Exploring New Mexico Landscapes

Sudhir Thakur (University of North Dakota) Location Patterns of R&D in India

Steve Perlmutter (College of William and Mary) Italian Regional Immigrant Integration

Jon Sonstelie (UCSB) Trade Among Nations

Sheri Breen (St. Olaf College) A Survey of Global Environmental Politics

2:30 – 3:45

Promoting Spatial Understanding of Social Issues in Undergraduate Education

Marlese Durr (Wright State University) Spatial Analysis and Sociology: An Integration of the Old, New, and Important

Jennifer Earl (UCSB) Distributions of Prison Populations over Time in the United States

Glenwood Ross (Morehouse College) A Visual Exploration of Urban Poverty
Janice Bell (University of Washington) Mapping Health Disparities
Laurie Garo (University of North Carolina at Charlotte) Spatial Analysis of Juvenile Delinquency Risk Factors

3:45 – 4:15

Closing Celebration

Closing thoughts from the SPACE Education Coordinator (**Fiona Goodchild**), Workshop Coordinator (**Stuart Sweeney**), and Program Director (**Don Janelle**)

SPACE Certificates

6:00 p.m. – BBQ Dinner (Goleta Beach)

V. PEDAGOGIC RESOURCES (EXAMPLES FROM THE UCSB WORKSHOP)

Resources prepared and administered by Fiona Goodchild and Stacy Rebich

Discussion of Teaching Philosophy and Pedagogy

General Issues

1. Discuss your teaching philosophy and strategies for keeping students motivated and helping them to learn effectively.

2. Beyond the acquisition of specific content knowledge, what learning goals do you have for students in your courses?

Concerns

3. What do you see as the barriers to teaching undergraduates to think spatially? Are any of these barriers specific to your discipline or your institution? What ideas do you have for addressing these problems?

4. How do you plan to motivate students to think spatially about the questions in your discipline?

5. Do you expect that incorporating spatial analysis into your course will require class/student study time that was previously dedicated to something else? If so, how do you plan to find the extra time necessary for these new activities?

Assessment of Student Learning

6. How do you currently assess student learning in this course?

7. Do you feel that your current student assessment methods will be adequate for evaluating the student learning that results from a spatial approach to the material? Why or why not?

Guiding Thought-Provoking Questioning

Generic Questions	Specific Thinking Skills Induced
What is a new example of…?	Application
How could … be used to …?	Application
What would happen if…?	Prediction/hypothesizing
What are the implications of …?	Analysis/inference
What are the strengths and weaknesses of …?	Analysis/inference
What is … analogous to?	Identification and creation of analogies and metaphors
What do we already know about…?	Activation of prior knowledge
How does … affect …?	Analysis of relationship (cause-effect)
How does … tie in with what we learned before?	Activation of prior knowledge
Explain why …	Analysis
Explain how…	Analysis
What is the meaning of …?	Analysis
Why is … important?	Analysis of significance
What is the difference between … and …?	Comparison-contrast
How are … and … similar?	Comparison-contrast
How does … apply to everyday life?	Application – to the real world
What is the counterargument for …?	Rebuttal argument
What is the best …, and why?	Evaluation and provision of evidence
What are some possible solutions to the problem of …?	Synthesis of ideas
Compare … and … with regard to …	Comparison-contrast
What do you think causes …? Why?	Analysis of relationship (cause-effect)
Do you agree or disagree with this statement: …? What evidence is there to support your answer?	Evaluation and provision of evidence
How do you think … would see the issue of …?	Taking other perspectives

From: King, A. (1994). Inquiry as a tool in critical thinking. In D.F. Halpern (Ed.), *Changing college classrooms: New teaching and learning strategies for an increasingly complex world* (Vol. 89, pp. 13-38). San Francisco, CA: Jossey-Bass.

Svinicki's Seven Strategies for Enhancing Student Motivation

1. Be a good role model of appropriate motivation.
2. Choose learning tasks with utility, challenge, and interest value.
3. Encourage accurate student self-efficacy about the course.
4. Base evaluation on progress or absolute level achieved to produce a mastery goal orientation.
5. Encourage attributing success to effort and interpreting mistakes as learning opportunities.
6. Provide choice and/or control over goals or strategies to the learner.
7. Communicate high expectations that are in line with student capabilities.

From: Svinicki, M.D. (2004). *Learning and motivation in the postsecondary classroom*. Bolton, MA: Anker.

Motivation-enhancing conditions that enable students to do their best work:

1. Inclusion – students and teachers feel respected and connected.
2. Favorable attitude toward learning – students experience personal relevance and choice.
3. Meaningfulness – learning experiences are challenging and thought provoking and are based on learners' perspectives and values.
4. Competence – students feel they can succeed.
5. Leadership – high expectations (from the authority), structure, feedback, and support
6. Satisfaction – rewards

From: Svinicki, M.D. (2004) (see above). Based primarily on Wlodkowski, R. & Ginsberg, M. (1995) *Diversity and motivation: Culturally responsive teaching.* San Francisco, CA: Jossey-Bass, and on Theall, M. & Franklin, J. (1999). What have we learned? A synthesis and some guidelines for effective motivation in higher education. In M. Theall (Ed.), *New directions for teaching and learning: No 78. Motivation from within: Approaches for encouraging faculty and students to excel* (pp. 99-109). San Francisco, CA: Jossey-Bass.

Reflection and Goal Setting

Throughout the first two days of the workshop, what knowledge or ideas have you gained that will be useful in integrating spatial perspectives in your undergraduate courses? (Please be as specific as possible.)

How exactly could you use this new knowledge or these new ideas in your course planning and teaching?

How will you use this new knowledge as a part of your project for this workshop?

Any other comments or questions?

SPACE Curriculum Design Project

July 18-25, 2005 Name: _____

During the workshop, we expect you to create new teaching materials. We anticipate that you will produce your own materials, but encourage you to consult with others and work collaboratively. The following questions are designed to help you focus on a feasible goal.

For which course(s) will you use the materials you design at this workshop?

How will this element fit in with and complement other elements of the course curriculum?

How does this course fit in the context of your department or discipline?

Which specific topic will you address?

Which dataset(s) will the activity be based on?

- Currently have_____
- Need to acquire_____

Which type(s) of curriculum element will you design?

- ❑ Lecture materials
- ❑ Demonstration of spatial application
- ❑ Lab activity
- ❑ Homework activity or student project
- ❑ Other_____

How much course time (in hours) will the activity(ies) require?

- Lecture_____

- Lab_____
- Student work outside of class_____

What are the specific student learning goals for this curriculum element?

- Content_____
- Reasoning skills_____
- Technical skills_____

How will you assess student learning for this curriculum element?

- ❑ Project (writing/presentation) assignment with grading criteria
- ❑ Test questions (MC, short answer, essay)
- ❑ Homework questions
- ❑ Class discussion questions
- ❑ Other_____

Work timeline: Daily debriefing time will be available for questions/debugging.

	Projected Tasks	**Projected Materials Completed**
Tuesday		
Wednesday		
Thursday		
Friday		

Saturday presentation:

10-minute presentation; 5 minute Q & A
Maximum of 10 PowerPoint slides

Ideas for parallel session on spatial thinking:

- Discussion of questions posted to forum (first in small groups and then together if group is large)
- Individuals/pairs identify spatial concepts that are relevant to the curriculum element they are working on
- Individuals/pairs write/design assessment (test questions, writing assignment, project assignment, etc.) through which they plan to evaluate student understanding of these concepts
- Introduction of rubrics, rationale behind their use, examples
- Individuals/pairs develop rubrics for each chosen spatial concept as related to the assessment they have designed
- Group discussion/comparison of what they've come up with
- Post various rubrics on the web

Reflections on Undergraduate Instruction Principles and Implementation Techniques

From today's presentations and discussions, which idea(s) or approach(es) to undergraduate teaching and learning did you find useful or interesting?

What additional issues or questions related to teaching and learning would you like to see addressed this week?

Please include any other comments or questions on the back of this sheet.

UCSB SPACE workshop 2005 presenter's name: _____

Project Presentation Review Guidelines

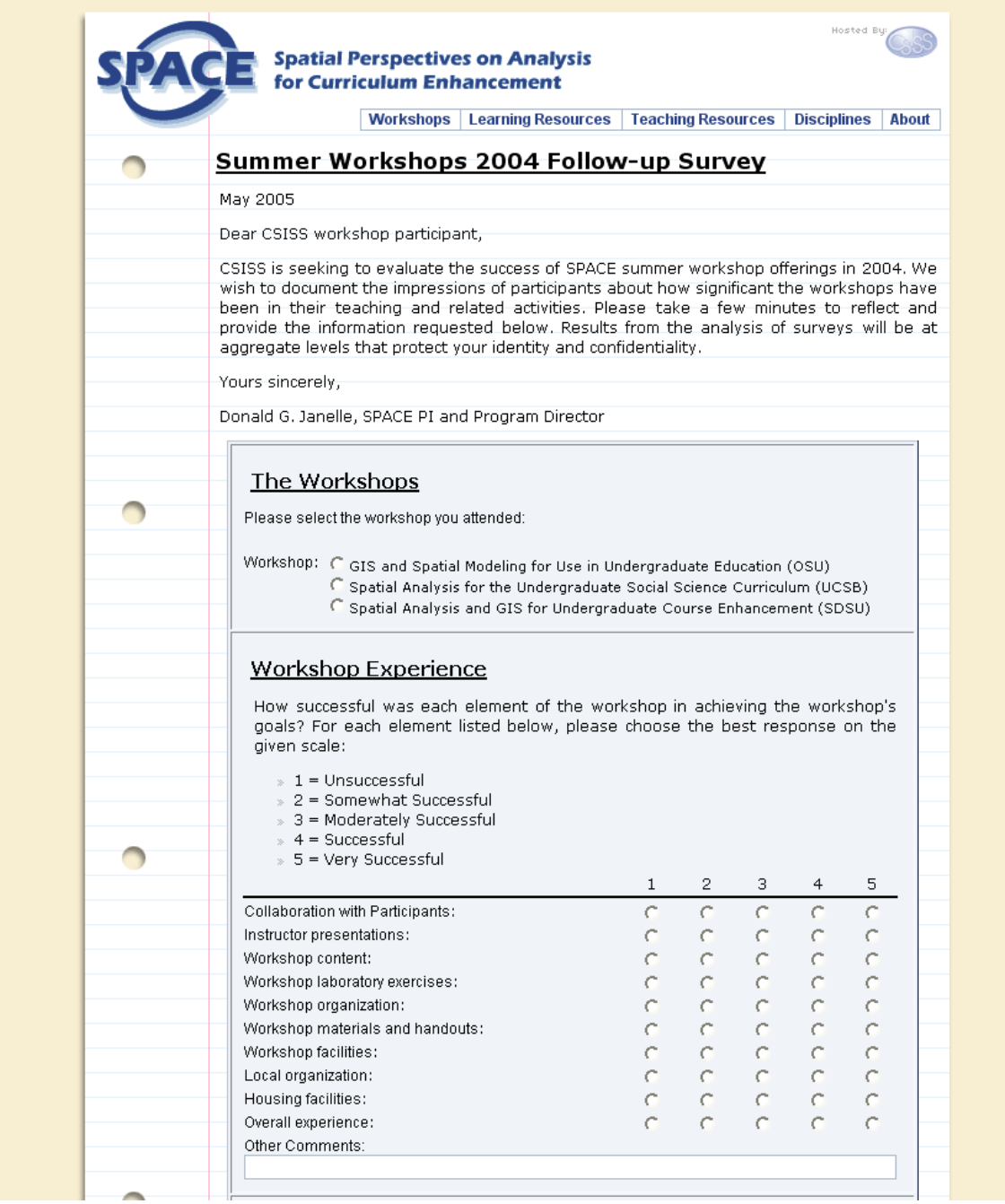
spatial concept	**4** **3** **2** **1**	Explicitly focuses on one or more spatial concepts and provides opportunities for students to learn both disciplinary content and spatial approaches. Prepared materials are logically sequenced to lead students to think spatially, and all necessary steps in the thought process are made apparent.	**Comments:**
connection with discipline	**4** **3** **2** **1**	Clearly illustrates and provides examples of how a spatial approach can be useful for thinking in the discipline. Materials prepared go beyond the specificity of one particular case study and successfully introduce the idea that it is valuable to approach many disciplinary themes from a spatial perspective.	**Comments:**
Assessment	**4** **3** **2** **1**	Explicitly discusses how the students' prior knowledge and learning will be assessed based on course learning objectives. Provides examples of assessment instruments (e.g. test/lab questions & exercises, lab/project assignment description & evaluation criteria).	**Comments:**
Aesthetics	**4** **3** **2** **1**	Visual materials are highly appealing, intellectually engaging, and constructed in a way that focuses the learners' attention on the key ideas being presented. Written and/or verbal instructions that accompany materials are complete, well organized, and easy to follow. Presentation does not go over time.	**Comments:**
Motivation	**4** **3** **2** **1**	Ideas and concepts are presented and learning is assessed in a way that is likely to motivate undergraduate social science students to make the effort to develop spatial thinking skills and apply them to social science questions.	**Comments:**

Additional comments:

VI. FOLLOW-UP SURVEY OF 2004 WORKSHOP PARTICIPANTS AND RESULTS FROM THE EDUCATIONAL DEVELOPMENT AWARDS PROGRAM

This survey was administered by an email notification. Respondents entered their assessments on a web-based form on the SPACE website approximately 10 months after completion of the 2004 workshops. Of the 53 participants who completed the 2004 workshops, 39 completed the survey (72%).

Follow-up Survey of 2004 Workshop Participants



SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Hosted By: CSISS

Workshops | Learning Resources | Teaching Resources | Disciplines | About

Summer Workshops 2004 Follow-up Survey

May 2005

Dear CSISS workshop participant,

CSISS is seeking to evaluate the success of SPACE summer workshop offerings in 2004. We wish to document the impressions of participants about how significant the workshops have been in their teaching and related activities. Please take a few minutes to reflect and provide the information requested below. Results from the analysis of surveys will be at aggregate levels that protect your identity and confidentiality.

Yours sincerely,

Donald G. Janelle, SPACE PI and Program Director

The Workshops

Please select the workshop you attended:

Workshop:
- GIS and Spatial Modeling for Use in Undergraduate Education (OSU)
- Spatial Analysis for the Undergraduate Social Science Curriculum (UCSB)
- Spatial Analysis and GIS for Undergraduate Course Enhancement (SDSU)

Workshop Experience

How successful was each element of the workshop in achieving the workshop's goals? For each element listed below, please choose the best response on the given scale:

- 1 = Unsuccessful
- 2 = Somewhat Successful
- 3 = Moderately Successful
- 4 = Successful
- 5 = Very Successful

	1	2	3	4	5
Collaboration with Participants:	○	○	○	○	○
Instructor presentations:	○	○	○	○	○
Workshop content:	○	○	○	○	○
Workshop laboratory exercises:	○	○	○	○	○
Workshop organization:	○	○	○	○	○
Workshop materials and handouts:	○	○	○	○	○
Workshop facilities:	○	○	○	○	○
Local organization:	○	○	○	○	○
Housing facilities:	○	○	○	○	○
Overall experience:	○	○	○	○	○

Other Comments:

Impacts of the Workshop

What impact has the workshop had on your own work? For each element listed below, please choose the best response on the given scale:

- 1 = No Impact
- 1 = Very Little Impact
- 3 = Some Impact
- 4 = Moderate Impact
- 5 = Strong Impact

	1	2	3	4	5
Other (describe below):	○	○	○	○	○
New ideas for content of undergraduate courses:	○	○	○	○	○
New labs or exercises for undergraduate courses:	○	○	○	○	○
New courses that include student learning about spatial analysis:	○	○	○	○	○
Plans for new modules that will engage undergrads in spatial analysis theory and/or techniques:	○	○	○	○	○
Assessment of student ability to use spatial analysis:	○	○	○	○	○
Discussion with teaching colleagues about new resources for teaching spatial analysis:	○	○	○	○	○
Formal presentations to teaching colleagues about new resources for teaching spatial analysis:	○	○	○	○	○
Plans to make presentations about SPACE at professional meetings:	○	○	○	○	○
Have already made presentations about SPACE at professional meetings:	○	○	○	○	○

Other Comments:

Further Comments

Please provide suggestions for changes or additions to the workshop content that would help improve the overall experience. Any other information or insights that you believe might help workshop organizers, including any suggestions of subject matter that could provide the focus of a future workshop is also encouraged:

Reset Form | Submit Form

-or- Mail / Fax to:
SPACE / Department of Geography
University of California
3510 Phelps Hall
Santa Barbara CA, 93106-4060
Fax: 805-893-8617

Printable Version

Summer Workshops 2004 Follow-up Survey — Results

Measures	UCSB	OSU	SDSU
WORKSHOP EXPERIENCE			
Collaboration with participants	4.30	4.29	3.71
Instructor presentations	4.40	4.21	4.43
Workshop content	4.60	4.21	4.29
Workshop lab exercises	4.10	3.38	3.86
Workshop organization	4.30	4.21	4.14
Materials and handouts	4.20	4.36	4.00
Workshop facilities	4.60	4.36	4.57
Local organization	4.70	4.64	4.64
Housing facilities	4.50	3.50	3.69
Overall experience	4.33	4.31	4.21
IMPACTS OF WORKSHOPS			
New ideas for content in undergraduate courses	4.30	4.00	4.00
New labs or exercises for undergraduate courses	4.50	4.40	3.47
New courses for student learning about spatial analysis	3.40	3.23	3.07
New modules to engage undergrads in spatial analysis	4.20	4.23	3.60
Assessment of student ability to use spatial analysis	3.30	3.46	2.80
Discussion with teaching colleagues teaching spatial analysis	4.40	4.08	4.13
Presentations to colleagues about teaching spatial analysis	3.80	3.54	3.07
Plans for presentations about SPACE at professional meetings	3.60	3.15	2.20
Made presentation about SPACE at professional meeting	3.20	1.92	1.47

The results from the follow-up survey show generally positive experiences at the workshops and moderate to significant impacts on the teaching and dissemination efforts (discussion with others, presentations to colleagues and at meetings) among 2004 workshop participants. The data also flag areas for consideration by instructional teams, especially the need to enhance the transfer of skills and awareness of learning assessment strategies. We suspect that progress made in this area for the 2005 workshops will be reflected in next year's follow-up survey (to be administered in May 2006).

Results from the 2004 Instructional Development Awards Program

The 2004 SPACE Instructional Development Awards program provides another way of evaluating the success of the program in its first year. In response to a solicitation, 14 applications were submitted and 12 awards were made. This is up from the 3 or 4 awards that we had suggested in the original proposal — making use of participant funds left over from the first year. These applications (in response to web advertising and direct email messages to all participants) reflect tangible accomplishments in developing new exercises, modules, and courses. The SPACE website features examples from each of the award winners – new syllabi, examples of exercises, and student projects (see www.csiss.org/SPACE/materials/participants). There are also descriptions of how the award recipients planned to use the awards – e.g., taking advanced courses in spatial analysis, attending a conference or workshop, sponsoring a forum or campus-wide workshop on the introduction of spatial methods in undergraduate teaching, etc. Recipients represented the disciplines of archaeology, communication, criminal justice, economics, geography, history, and sociology. We very much look forward to the next round of applications from the 2005 workshop participants. This program has enabled SPACE to provide examples on its website of what workshop participants can accomplish.

Instructional Development Award Winners (2004 SPACE Workshops)			
Award Recipients	**Affiliation**	**Accomplishments**	**Planned Use of Award**
Veronica Arias, Heather Richards, & Judith Van der Elst $2250	Archaeology, University of New Mexico	Developed new undergraduate course on Geospatial Analysis in Archaeology.	Participate in conference and workshop; organize symposium on spatial analysis for archaeologists; further course development.
Kathleen Bell $1000	Economics, University of Maine	Altered course on Resource Economics for independent student projects and spatial thinking using GIS and spatial statistics.	Attend conference on Computers in Urban Planning and Urban Management, in London, for gaining new ideas for course development.
Wendy Bigler $750	Geography, Southern Illinois University Carbondale	Designed core curriculum class on "Environmental Conservation" that emphasizes critical spatial reasoning. Introduced GeoDA-based exercises for three other courses.	Collaborate with Chris Weiss on a "best practices" article about using GeoDA in undergraduate social science classrooms. Presentation at AAAS (2006).
Mark Bjelland $1000	Geography, Gustavus Adolphus College	New course syllabus making use of GeoDa and ArcView, introducing GeoDa to colleagues for undergraduate teaching, and plans for a college-wide workshop on why space matters in statistical analysis.	Attend conference on Computers in Urban Planning and Urban Management, in London, for purposes of further undergraduate course development.
Ulla Bunz $1000	Communicatio n, Rutgers University	Redesigned course syllabus to include "spatial perspectives on social change" and developed student field research exercises.	Organize a short course on integrating spatial research in Communication teaching for the International Communication Association meetings in Dresden (2006).
Owen Dwyer $500	Geography, Indiana University, Indianapolis	Developed course exercise to measure the influence of distance on society, using the gravity model as a basis for students to apply and think critically about spatial modeling.	Participate in spatial analysis workshops at the annual meeting of the Association of American Geographers.
Jo Beth Mertens $1250	Economics, Hobart and William Smith Colleges	**Developed a course exercise "Introducing Spatial Analysis Using GeoDa" and gave related presentation at the "Teaching Economics: Instruction and Classroom Based Research" conference.**	Attend a course by Luc Anselin on spatial statistics and offer a seminar on spatial analysis in teaching for undergraduate instructors at Hobart and William Smith Colleges.
David Padgett $750	History, Geography, and Political Science, Tennessee State	Designed modules using student-gathered research data to demonstrate spatial concepts, using ArcGIS, GeoDa, and FlowMapper.	Presentation on "GIS-Supported Demonstration Modules in an Undergraduate Urban Geography Course" for the 2005 ESRI Education User Conference.

	University		
Susan Pulsipher $500	Director, Library Services, Methodist College	Developed syllabus for course on *Introduction to Spatial Analysis*. Developing plans for baseline survey on GIS use and for implementing incorporation of GIS into the curriculum of the college.	Participate in workshops to enhance uses of GIS in studies of criminal justice and community participation, and present papers on using GIS in teaching to conferences on library and information science.
Sumeeta Srinivasan $500	Division of Engineering and Applied Sciences, Harvard University	Introduced course on "Spatial Analysis of Environmental and Social Systems," attracting students from Applied Mathematics, Economics, Environmental Sciences, the Kennedy School of Government, Earth and Planetary Sciences, and Environmental Engineering. GIS and GeoDa are featured.	Explore organization of a Harvard/ MIT/ BU community workshop on spatial analysis, involving leading researchers in the GIS and spatial analysis fields. Present a paper on teaching spatial analysis to a social science conference.
Christopher Weiss $750	Sociology, Columbia University	New courses designed for interdisciplinary Urban Studies undergraduate program at Columbia-Barnard: "Conceptual Issues in Spatial Analysis for the Social Sciences," and "Methodological Issues in Spatial Analysis for the Social Sciences." Both courses employ modules for students to use GIS and GeoDa software.	Collaborate with Wendy Bigler on a "best practices" article about using GeoDA in undergraduate social science classrooms. Presentations planned for meetings of AAAS and / or The Association for Public Policy Analysis and Management (APPAM).
Petra Zimmermann $1250	Geography, Ball State University	Enhanced GIS course for a broad audience of social science and environmental science students.	Organize an on-campus workshop on "An Introduction to Spatial Analysis" for faculty and graduate teaching assistants at Ball State University.

VII. USE OF SPACE WEBSITE 2005

Gamaiel Zavala, SPACE Webmaster

Traffic logs were kept and analyzed by *WebTrends Log Analyzer* for one year (August 1, 2004 – August 15, 2005). The number of visitors increased 4.6 times and average daily traffic was up 2.6 times that of the 2004 period. Of those visiting the site, 23% were repeat visitors and, on average, they spent twice as much time at the site (nearly 22 minutes) than in the prior year (about 12 minutes).

Average hits per day – 1,538	Total hits – 584,598
Average visitors per day – 144	Total visitors – 54,760
Number of Unique visitors – 12,788	Average visitor length – 21:40 minutes

The most requested areas of the site (by directory):

- Workshops (19,790 visits)
- Teaching Materials / Discipline Resources (16,767)
- Learning Resources (11,958)
- Forums (6,352)
- About SPACE (5,405)
- My Page (1,633)

The most requested pages on the site:

- Home Page (6,354)
- Workshops Home (4,169 visits)
- Discipline Resources Home (3,463)
- Forums Home (2,414)
- UCSB Workshop Home (1,591)
- OSU Workshop Home (1,289)
- Learning Resources Home (1,276)
- GIS Cookbook TOC (1,271)
- Teaching Resources Home (1,269)
- About the Program (1,252)
- SFSU Workshop Home (1,160)
- Choosing a GIS (1,139)

The most downloaded files:

- Workshops Flyer (829)
- The Meaning of Spatial Thinking, Goodchild (565)
- Proposal (354)
- Spatial Aspects of Globalization, Appelbaum (337)
- Project Summary (326)

Use / Evaluation of Web Resources at www.csiss.org/SPACE by Workshop Participants

	Syllabi Collection	Assessment Links	Discipline Resources	On-line Forum	My Page
Did not use it	25	32	33	43	53
Not useful	1	2	0	1	1
Somewhat useful	15	8	10	9	7
Very useful	22	21	19	10	2
Percent of Users rating resources "Very Useful"	75%	68%	66%	50%	20%

In year three of the project, attention will be devoted to improving the quality of resources made available on the site and on expanding the new sections on Participant Contributions, Conference Presentations, and Discipline Resources. The Forum and the MyPage resources will be dropped – they were intended for interactive use during the workshops, however the assessment is that most participants were too busy with in-house hands-on activities to manage simultaneous virtual exchanges.

On the Exit Survey, 82% of workshop participants rated the on-line application procedures as '4' and 18 percent as '3' on a scale of 1 (totally unacceptable) to 4 (excellent).

Note from the PI. Regrettably, SPACE has lost its Webmaster to Yahoo.com, as of 1 October 2005. We are currently advertising the position and hope to find an equally accomplished Webmaster as Gamaiel Zavala.

From NSF Fastlane Report

The following responses from D Janelle were copied from the NSF Fastlane Report:

Annual Report for Period: 10/2004 - 10/2005 **Submitted on:** 10/06/2005
Principal Investigator: Janelle, Donald. **Award ID:** 0231263
Organization: U of Cal Santa Barbara
Title:
Spatial Perspectives on Analysis for Curriculum Enhancement (SPACE)

Project Participants

Senior Personnel

Name: Janelle, Donald
Worked for more than 160 Hours: Yes
Contribution to Project:
Serves as Principal Investigator and Program Director for SPACE. He plans and coordinates all project activities with the overall objectives for the NSF CCLI national dissemination program. He works with the workshop coordinators for UCSB, OSU, and UCGIS on the development of workshop programs, directs the advertising for applicants and the selection process, cooperates with the SPACE Educational Development Coordinator on the implementation of instructional development components in the workshops and in the design of instruments for evaluating workshop results. He supervises the work of the project administrator and webmaster, hires and supervises graduate student assistants at UCSB, organizes planning meetings for project leaders from the three partner institutions and workshop planning meetings for UCSB, arranges for SPACE participation in national academic conferences, visits and instructs at all SPACE workshops, represents the SPACE project at annual academic conferences in the social sciences, and prepares documentation for annual reports to NSF and to UCSB's Institute for Social, Behavioral, and Economic Research.

Name: Appelbaum, Richard
Worked for more than 160 Hours: Yes
Contribution to Project:
As co-PI on the project, he participated in the December 2003 and 2004 planning meetings of the project team and has assisted in advertising the workshop program. As an award-winning teacher at UCSB, he gave a featured presentation to the 2004 workshop at UCSB. He featured the SPACE program workshops in a presentation to the Annual Meeting of the American Sociological Association in mid August 2004. His primary role in SPACE commenced in year two (2004-2005) of the project in helping to implement its program of short workshops at the annual meetings of academic societies. Two such workshops took place in 2005 and two more are currently in the planning stage for 2006. As Director of UCSB's Institute for Social, Economic, and Behavioral Research, he is well positioned to engage in this outreach effort.

Name: Goodchild, Michael
Worked for more than 160 Hours: Yes
Contribution to Project:
As a Co-PI on the project, he assisted in the overall design for the SPACE program and was one of the primary instructors in 2004 and 2005 workshops at UCSB and at San Diego State University in 2004. He was especially active in the planning and implementation of the workshops at UCSB; he participated in planning meetings, provided advice to the graduate students involved in setting up exercises, and worked closely with the PI and workshop coordinators in setting the workshop agenda.

Name: Kwan, Mei-Po
Worked for more than 160 Hours: Yes
Contribution to Project:
PI for the subcontract to Ohio State University. She was responsible for designing, implementing, coordinating the workshop program at Ohio State University. She took part in the SPACE planning meetings in Santa Barbara in December 2003 and 2004. She supervised other personnel working on the project at OSU, developed lecture plans

and lab exercises, and taught part of the 2004 and 2005 workshops. She is coordinating the follow-up activities and plans for the 2006 workshop at OSU.

Name: Getis, Arthur
Worked for more than 160 Hours: No
Contribution to Project:
PI for the UCGIS subcontract on the SPACE project. He participated in the planning meeting for the SPACE project in December 2003 and 2004, and served as Co-coordinator with John Weeks for the 2004 UCGIS SPACE workshop at San Diego State University. He was responsible for workshop development, was a principal workshop instructor, tutored participants, and supervised the work of Jared Aldstadt. In 2005, he worked with John Weeks to organize a special session on the SPACE program for the UCGIS Spring Assembly in Washington DC. He monitors participation of UCGIS in the SPACE project and assists in disseminating information about the program.

Name: Goodchild, Fiona
Worked for more than 160 Hours: Yes
Contribution to Project:
Fiona Goodchild serves as the Educational Development Coordinator for the Space Project. Her primary obligations are planning, documentation and evaluation of workshop outcomes. She prepared resources for and attended the SPACE planning meetings in December 2003 and 2004. She participated in the design of survey instruments for selecting participants and for workshop entry and exit surveys for all of the program workshops in 2004 and 2005. In addition, she provided instruction about curriculum development and student assessment in 2004 and 2005 for he UCSB workshops and for the 2004 SDSU summer workshop.
She also is a consultant to instructors in the OSU workshop. She worked with D. Janelle in supervising the assistance of Stacy Rebich and communicated with all workshop instructors on the pedagogical goals of the program. In fall 2004 and 2005, she assisted Don Janelle with pedagogical aspects of the annual SPACE report to the National Science Foundation.

Post-doc
Name: Keuper, Alex
Worked for more than 160 Hours: No
Contribution to Project:
He completed his PhD in June 2004. He was the primary lab instructor for the UCSB workshop; he prepared the workshop-related exercises on the use of GIS, and tutored participants on their educational development projects.

Graduate Student
Name: White, Eric
Worked for more than 160 Hours: Yes
Contribution to Project:
A PhD candidate in Anthropology and an expert on the development of Internet search engines, he held a 35 % appointment in the Fall 2003 and Winter 2004 quarters. His role was to locate web resources that feature educational curriculum development and learning assessment. These are presented on the SPACE website (www.csiss.org/SPACE). He also identified course syllabi on the Web that feature spatial perspectives in a range of social science disciplines. These were examined by workshop participants as examples for critique and emulation.

Name: Howarth, Jeff
Worked for more than 160 Hours: Yes
Contribution to Project:
He worked on a 35% graduate appointment in the Spring 2004 quarter and a 25% appointment in the summer to prepare resources for the 2004 workshop at UCSB. He prepared a document to assist undergraduate instructors in choosing a GIS software package suitable for their needs and he gave a presentation on his work to participants in the UCSB workshop.

Name: Farrell, Rob
Worked for more than 160 Hours: No
Contribution to Project:

He provided tutorial assistance on GIS and spatial statistics to participants in the 2004 UCSB workshop. He worked with the workshop coordinator in setting up exercises on the use of the GeoDa software (exploratory spatial data analysis).

Name: Aldstadt, Jared
Worked for more than 160 Hours: No
Contribution to Project:
He prepared lab exercises and instructed and tutored participants in the use of GIS and GeoDa software exercises at the 2004 workshop held at San Diego State University (host university for the UCGIS SPACE workshop).

Name: Ren, Fang
Worked for more than 160 Hours: Yes
Contribution to Project:
She helped to advertise and coordinate the 2004 workshop at Ohio State University, assisted in the development of lab exercises, and provided tutorial support in the lab sessions.

Name: Boschmann, Eric
Worked for more than 160 Hours: Yes
Contribution to Project:
He assisted with overall project coordination for the 2004 workshop at Ohio State University, assisted in advertising the workshop, contributed to workshop logistics, helped in the development of lab exercises, and provided tutorial support during the lab sessions.

Name: Klaf, Suzanna
Worked for more than 160 Hours: No
Contribution to Project:
She helped with logistics during the 2004 and 2005 workshops at Ohio State University. She sent out fliers to more than 100 academic departments, helped to coordinate the workshops, and assisted in the development of lab exercises.

Name: Ding, Guoxiang
Worked for more than 160 Hours: No
Contribution to Project:
Provided assistance with logistics and lab sessions for the 2004 and 2005 workshops at Ohio State University. This work was funded by the Department of Geography at OSU.

Name: Hui, Wei
Worked for more than 160 Hours: No
Contribution to Project:
Provided assistance with logistics for the 2004 workshop at Ohio State University. This work was funded by the Department of Geography at OSU.

Name: Davis, Jason
Worked for more than 160 Hours: No
Contribution to Project:
Provided assistance with logistics for the 2004 and 2005 workshops at Ohio State University. This work was funded by the Department of Geography at OSU.

Name: Rebich, Stacy
Worked for more than 160 Hours: Yes
Contribution to Project:
A PhD student with an interest in educational development and learning assessment. She provided educational development support for the SPACE project in 2004 and 2005, assisting Fiona Goodchild in the refinement of survey instruments, grouping of workshop participants according to expertise and needs, providing tutorial support and instruction for workshops participants in the UCSB and SDSU workshops in 2004 and the UCSB and SFSU workshops in 2005. She maintains the workshop library for participant use and she designs workshop exercises and resources for educational development initiatives. In addition, she has been involved in processing data and

interpreting results on program evaluation. She contributed to instructor orientation for the 2004 planning meeting and worked closely with the PI and webmaster to enhance resources on the SPACE website.

Name: Griswold, Julia
Worked for more than 160 Hours: No
Contribution to Project:
Julia Griswold is an MA candidate in the Department of Geography at SFSU. She prepared census lab exercise and lab materials on ArcCatalog and map projections. She assisted with exercise preparation and testing, and helped participants during workshop labs for the SFSU workshop in 2005.

Name: Hemphill, Jeff
Worked for more than 160 Hours: No
Contribution to Project:
A Ph.D. candidate at UCSB. He was a workshop lab instructor and project consultant for participants in the 2005 UCSB workshop. He designed some of the lab exercises.

Name: Battersby, Sarah
Worked for more than 160 Hours: No
Contribution to Project:
A Ph.D. candidate at UCSB. She was a workshop lab instructor and project consultant for participants in the 2005 UCSB workshop. She designed some of the lab exercises.

Name: Yoo, Enki
Worked for more than 160 Hours: No
Contribution to Project:
A Ph.D. candidate at UCSB. She was a workshop lab instructor and project consultant for participants in the 2005 UCSB workshop.

Undergraduate Student
Name: Williams, Andrew
Worked for more than 160 Hours: No
Contribution to Project:
An undergraduate student in the SFSU Urban Studies program who assisted with the 2005 workshop preparation (Xeroxing, assembling packets and exercise binders).

Name: DeJesus, Anthony
Worked for more than 160 Hours: No
Contribution to Project:
Anthony DeJesus is an undergraduate SFSU film major who prepared a short documentary video of the 2005 SFSU workshop. This will be used to illustrate the SPACE program at a 2006 Assembly of the UCGIS.

Name: Pennucci, Aly
Worked for more than 160 Hours: No
Contribution to Project:
Aly Pennucci is an undergraduate student in the SFSU Urban Studies program who assisted with the 2005 workshop preparation re: liaison to participants about housing arrangements. She assisted with photocopying.

Technician, Programmer
Name: Zavala, Gamaiel
Worked for more than 160 Hours: Yes
Contribution to Project:
Webmaster and database development and management for the SPACE project. In 2003-2004, he developed the project's website (www.csiss.org/SPACE) as a basis for web advertising and project dissemination of instructional and course development resources. He designed all of the automated database management systems for participant applications and processing, and for workshop entry and exit surveys, providing a range of output to enable the PI and workshop organizers for all three workshops to assess applicants and to understand the backgrounds and needs of workshop participants. In addition, he created a customized web forum for participant-instructor dialog during

and after workshops and developed a 'My Page' resource for workshop participants to store and retrieve customized teaching and learning resources that they find useful in their curriculum development efforts. He also serves as liaison with the systems director of the computer labs used in the 2004 and 2005 workshops at UCSB. In 2005, he worked closely with SPACE award recipients and conference workshop presenters in documenting their undergraduate instructional activities. The interface developed for these presentations will continue to be used for displaying the work of 2005 and 2006 workshop participants -- providing examples for instructors from a broad range of social science disciplines and interdisciplinary programs.

Name: Nickel, Barry
Worked for more than 160 Hours: Yes
Contribution to Project:
Barry Nickel is the Associate Director of the SFSU Institute for Geographical Information Science. He oversaw all technical aspects of the 2005 workshop, including preparation of labs, data installation, and troubleshooting. He assisted in designing workshop content and he developed and delivered lectures on attribute tables, vector GIS analysis, and GIS resources for social scientists. He attended all workshop sessions.

Name: Cohen, Jesse
Worked for more than 160 Hours: No
Contribution to Project:
Jesse Cohen provides technical support for the SFSU Institute for Geographical Information Science. He assisted Barry Nickel with technical aspects of the 2005 workshop. He also helped with workshop organization: overseeing preparation of materials, preparing exercises, managing logistics, and liaison to workshop participants.

Other Participant
Name: Weeks, John
Worked for more than 160 Hours: No
Contribution to Project:
Co-Coordinated (with Art Getis) the development and implementation of the 2004 workshop at San Diego State University. He handled the workshop logistics, budgeting and related issues, and was a primary instructor in the workshop, responsible for presentations and for tutoring participants. He also participated in the December 2003 and 2004 SPACE planning meetings -- representing SDSU and UCGIS. In 2005 he coordinated a special session featuring the teaching accomplishments of SPACE workshop participants at the Spring Assembly of the UCGIS in Washington DC.

Name: Brown, Christian
Worked for more than 160 Hours: Yes
Contribution to Project:
Project administrator for the SPACE program since October 2003. Provides assistance to the PI on workshop advertising and application processing, processes all invoices on expenses for the UCSB workshop -- publications, printing, software, etc. He organizes accommodations, reserves classroom and lab space, and provides logistical assistance to the workshop organizers and participants at the UCSB workshop. He handles the preparation of participant stipends and certificates of completion for all three SPACE workshops and is responsible for all correspondence with workshop participants. He reviews all instructions to participants that appear on the SPACE website for accuracy and compliance with NSF regulations.

Name: Sweeney, Stuart
Worked for more than 160 Hours: Yes
Contribution to Project:
A Professor of Geography with expertise in spatial analysis. He worked with the PI and with Sara Fabrikant to organize the workshop agenda for the 2004 UCSB workshop and was the primary coordinator for the 2005 UCSB workshop. He supervised graduate students in the development of exercises using the GeoDa software (exploratory spatial data analysis) and presented instruction and offered tutorial support to participants throughout the workshop. He also played an important role in the December 2003 and 2004 SPACE planning meetings.

Name: Fabrikant, Sara
Worked for more than 160 Hours: No
Contribution to Project:

A Professor of Geography with expertise in cartographic visualization of research data. She worked with the PI and with Stuart Sweeney in co-organizing the 2004 UCSB workshop. She was a primary instructor for the 2004 and 2005 UCSB workshops. She prepared lab exercises on the integration of GIS with other data visualization tools, lectured, and provided consultation for participants on their workshop projects.

Name: Tobler, Waldo
Worked for more than 160 Hours: No
Contribution to Project:
Emeritus Professor and one of the World's leading analytical and theoretical cartographers, he was one of the lead instructors in the 2004 and 2005 UCSB workshops. He developed tutorials, exercises, and data sets to accompany the customized software that he developed (FlowMapper) for free download by workshop participants and their students. He also participated in the December 2003 and 2004 planning meetings for the SPACE project and contributed to planning the agenda of UCSB workshops.

Name: Jankowski, Piotr
Worked for more than 160 Hours: No
Contribution to Project:
He was an instructor at the 2004 workshop at San Diego State University, responsible for presentations and exercises on public participation GIS and for tutoring participants.

Name: Murray, Allan
Worked for more than 160 Hours: No
Contribution to Project:
He was an instructor in the 2004 and 2005 workshops at Ohio State University. He developed related teaching materials and lab exercises.

Name: O'Kelly, Morton
Worked for more than 160 Hours: No
Contribution to Project:
He was an instructor in the 2004 and 2005 workshops at Ohio State University. He developed related teaching materials and lab exercises.

Name: Tiefelsdorf, Michael
Worked for more than 160 Hours: No
Contribution to Project:
He was an instructor in the 2004 and 2005 workshops at Ohio State University. He developed related teaching materials and lab exercises. He also participated in the SPACE project-planning meeting in Santa Barbara in December 2003 and was involved in designing the original workshop program for OSU.

Name: Xiao, Ningchuan
Worked for more than 160 Hours: No
Contribution to Project:
He was an instructor in the 2004 and 2005 workshops at Ohio State University. He developed related teaching materials and lab exercises.
Name: McLafferty, Sara
Worked for more than 160 Hours: No
Contribution to Project:
Department of Geography, University of Illinois, Urbana-Champaign. She gave guest lectures in the 2004 and 2005 workshops at Ohio State University, illustrating the role of GIS and spatial analysis in health studies and in teaching.

Name: Shaw, Shih-Lung
Worked for more than 160 Hours: No
Contribution to Project:
Professor, Department of Geography, University of Tennessee. He gave a guest lectures in the 2004 and 2005 workshops at Ohio Sate University.

Name: Rey, Serge

Worked for more than 160 Hours: No
Contribution to Project:
He was an instructor in the 2004 workshop at San Diego State University, demonstrating the STARS (Space-Time Analysis of Regional Systems) open-source software and its potential uses in undergraduate social science education.

Name: Herr-Harthorn, Barbara
Worked for more than 160 Hours: No
Contribution to Project:
Research Professor in Anthropology. She gave a guest presentation on spatial perspectives on risk assessment in public health.

Name: Freudenberg, William
Annual Report: 0231263
Page 7 of 52
Worked for more than 160 Hours: No
Contribution to Project:
Professor of Environmental Studies and Sociology. He gave a presentation to the 2004 UCSB workshop participants.

Name: Lobao, Linda
Worked for more than 160 Hours: No
Contribution to Project:
Department of Sociology, OSU. She gave a guest lecture in the workshop and helped with several other sessions during the 2004 workshop at Ohio State University. In 2005, she joined the panel discussion on teaching and gave a guest lecture in the workshop.

Name: Proctor, James
Worked for more than 160 Hours: No
Contribution to Project:
Professor of Religious Studies and Geography at UCSB -- gave presentation to the 2004 UCSB workshop participants on spatial perspectives in the regional of cultural values and attitudes.

Name: Kuhn, Peter
Worked for more than 160 Hours: No
Contribution to Project:
Professor of Economics, UCSB. He gave a guest presentation to the 2004 UCSB workshop on applications of spatial thinking in economics, with examples of how he treats this in undergraduate teaching.

Name: Usery, Lynn
Worked for more than 160 Hours: No
Contribution to Project:
As 2003-2004 President of the University Consortium for Geographic Information Science (UCGIS), he was responsible for selecting San Diego State University to host the UCGIS SPACE workshop in 2004 and for overseeing management of the UCGIS subcontract on the SPACE project. He also participated in the December 2003 SPACE project-planning meeting in Santa Barbara.

Name: Plank, Kathryn
Worked for more than 160 Hours: No
Contribution to Project:
Associate Director, Office of Faculty & TA Development, Ohio State University. She helped in designing the educational development component of the OSU workshops, facilitated the activities of participant focus groups, and taught part of the 2004 and 2005 workshops at Ohio State University. She also took part in the 2004 SPACE planning meeting in Santa Barbara, providing workshop instructors with guidance on student learning styles.

Name: Johnson, Richard
Worked for more than 160 Hours: No

Contribution to Project:
Senior Instructional Consultant with the UCSB Office for Instructional Consultation. He participated in the SPACE planning meetings in December 2003 and 2004, and he provided advisory support and resources for the project's Educational Development Coordinator.

Name: Nicholson, Stanley
Worked for more than 160 Hours: No
Contribution to Project:
Director of the Office of Instructional Consultation at UCSB. He participated in the SPACE planning meeting in December 2003 and provided advisory support and resources for the project's Educational Development Coordinator.

Name: Cartwright, Donald
Worked for more than 160 Hours: No
Contribution to Project:
Professor Cartwright is one of the most highly recognized teachers in Canada – a recipient of the highest possible awards for the University of Western Ontario (UWO), for the Province of Ontario, and for Canada. He participated as a project advisor at the December 2003 and 2004 SPACE planning meetings, sharing ideas about the faculty mentor program that he coordinates for the Teaching Support Center at the University of Western Ontario. He continues as a primary educational development advisor on the SPACE project.

Name: Fournier, Eric
Worked for more than 160 Hours: No
Contribution to Project:
Professor Fournier (Samford University in Alabama) participated as a project advisor at the December 2003 and 2004 SPACE planning meetings in Santa Barbara. He shared ideas based on his experience as Co-Principal Investigator in an NSF-supported program for GIS instruction for science and social science instructors at Samford (Academic Excellence through GIS project (AEGIS)). He also shared ideas from his involvement as an instructor in the NSF-supported Geography Faculty Development Alliance Workshops, led by Kenneth Foote at the University of Colorado.

Name: LeGates, Richard
Worked for more than 160 Hours: Yes
Contribution to Project:
Richard LeGates
Position: Professor of Urban Studies SFSU
Worked more than 160 hours: Yes

Richard LeGates served as Coordinator of the 2005 SFSU workshop and as project principle investigator on behalf of the University Consortium for Geographic Information Science for the second year of the SPACE project. He contributed to the SPACE Planning meeting in Santa Barbara in December 2004, managed personnel and budget and played the lead role in designing the SFSU workshop content. He developed and taught lectures introducing ArcGIS, on vector GIS, on computerized cartography, and on GIS resources for social scientists. He attended all workshop sessions and prepared a final report on the SFSU workshop. He will be organizing a SPACE session for one of the year 2006 assemblies of the UCGIS.

Name: Pamuk, Ayse
Worked for more than 160 Hours: No
Contribution to Project:
Ayse Pamuk is an Associate professor of Urban Studies at SFSU. She prepared and delivered a lecture on the use of census data in spatial analysis at the 2005 SFSU SPACE workshop, and oversaw a lab exercise on the use of census data in GIS.

Name: Clarke, Keith
Worked for more than 160 Hours: No
Contribution to Project:

Keith Clarke is a Professor of Geography, U.C. Santa Barbara. He delivered the keynote address at the 2005 SFSU workshop and led discussion on use of GIS in social science teaching.

Name: Kirkeberg, Max
Worked for more than 160 Hours: No
Contribution to Project:
Max Kirkeberg is a Professor of Geography at SFSU. He led a walking tour of San Francisco's South of market district for the participants of the 2005 SFSU workshop, several with teaching interests in urban studies.

Name: Padgett, David
Worked for more than 160 Hours: No
Contribution to Project:
A Professor of Urban Studies at Tennessee State University who attended the 2004 SPACE workshop at UCSB. He presented a participant's perspective on the SPACE program at the 2004 SPACE Planning Meeting, assisted with applicant recruitment from HBCUs, organized two SPACE sessions at academic conferences in 2005, and contributed to instructional resources on the SPACE website.

Name: Jocoy, Christine
Worked for more than 160 Hours: No
Contribution to Project:
A Professor of Geography at California State University, Long Beach who attended the 2004 workshop at San Diego State University. She presented a participant's perspective on the SPACE program at the 2004 SPACE Planning Meeting.

Name: Van der Elst, Judith
Worked for more than 160 Hours: No
Contribution to Project:
A PhD Candidate at in Archaeology at the University of New Mexico who attended the 2004 workshop at Ohio State University. She presented a participant's perspective on the SPACE program at the 2004 SPACE Planning Meeting, assisted with applicant recruitment in her discipline, organized a SPACE-sponsored Forum on teaching GIS in the social sciences at the University of New Mexico, and contributed to instructional resources on the SPACE website.

Name: Liu, XiaoHang
Worked for more than 160 Hours: Yes
Contribution to Project:
XiaoHang Liu is an Assistant Professor of Geography at SFSU who served as the 2005 SFSU workshop's co-principle investigator. She contributed to the SPACE Planning meeting in Santa Barbara in December 2004 and played lead role in designing the SFSU workshop content. For the workshop, she developed and delivered lectures on GIS and GIS data, raster GIS, and GIS data acquisition. She developed a geocoding lab exercise and oversaw labs on raster GIS and geocoding. She attended all workshop sessions.

Organizational Partners

Ohio State University
Under the direction of Professor Mei-Po Kwan, Ohio State University's Geography Department is a partner in the SPACE program under a subcontract from UCSB. OSU's primary role is in offering a one-week workshop on 'GIS and Spatial Modeling for Use in Undergraduate Education' in each of the three years of the program.

The Department has provided additional funding for graduate students working during the workshop and for social events for workshop participants. In addition, it has provided lab and classroom space and has contributed staff support time for organizing workshop events.

OSU Geography has contributed a teaching laboratory with 50 PCs running all the GIS and statistical software needed for the workshop. The department has also reserved two additional teaching laboratories with about 10 seats of computers and three classrooms (including one classroom with a capacity of 75, and two seminar rooms). The

department also helped participants with needs on Xeroxing and faxing. The department has contributed $1000 to help with costs like providing social activities and hiring students to help with logistics. The department also paid for the tuition and fees for the two graduate student assistants.

Professor Kwan has assisted in the design of workshop survey instruments (application, entry, and exit); she and Professor Tiefelsdorf participated in a two-day planning meeting for the SPACE program in December 2003; and she contributed to the 2004 planning meeting, as well.

San Diego State University
In 2004, San Diego State University's Department of Geography was selected to host a SPACE workshop on behalf of the UCGIS under a subcontract to UCSB. This occurred on 2-6 August. The Department's support included funding for social events for workshop participants and the use of in-kind and facility resources. Facilities included a 'smart' classroom, a seminar room, and a laboratory that enabled each participant to work independently at a properly loaded computer with software for all workshop activities.

The SDSU Department of Geography boasts outstanding GIS laboratories and considerable experience in conducting workshops and short-courses. The workshop took place on the third floor of Storm Hall. The main classroom is equipped with the latest presentation technology. The facility used for this workshop is the Richard Wright Laboratory for Spatial Analysis, a state of the art facility with two-dozen workstations. All machines were loaded with the new software, GEODA, a creation of Luc Anselin (University of Illinois) as part of the NSF funding to the Center for Spatially Integrated Social Science (CSISS). In addition, participants were in a position to use STARS, a new time-space analytic package by Serge Rey (SDSU), and FlowMapper, a spatial interaction package created by Waldo Tobler of UCSB with support from CSISS. Participants could use the laboratory at all times during the week. In addition, display material was available in the Center for Earth Systems Analysis and Research (CESAR), an advanced spatial analytic laboratory of the Department of Geography and in a large seminar room. Professor Douglas Stow (SDSU) took the participants on a tour of the specialized facilities in CESAR. Coffee and cookies were available each day in the seminar room and on the veranda of Storm Hall.

University Consortium for Geographic Information Science
The University Consortium for Geographic Information Science (UCGIS) is a partner in the SPACE program under subcontract to UCSB. The UCGIA President (Lynn Usery in 2004; Nina Lam in 2005; John Wilson in 2006) is responsible for the selection of a member institution to offer a weeklong workshop on 'Spatial Analysis and GIS for Undergraduate Course Enhancement in the Social Sciences.'

For 2004, this workshop was offered by San Diego State University (2-6 August 2004), with Arthur Getis and John Weeks as workshop coordinators. For 2005, Richard LeGates of San Francisco State University organized and offered the workshop. For 2006, the University of Oklahoma, under the leadership of Tarek Rashid will offer a workshop on using Remote Sensing in undergraduate social science education.

UCGIS also assisted in advertising the SPACE program through its website (www.ucgis.org), and through member institutions, and provided the assistance of Professors Lynn Usery, Arthur Getis, and the UCGIS presidents at the December 2003 and 2004 planning meetings for the SPACE program. It also sponsored a SPACE session at its 2005 Spring Assembly in Washington DC.

San Francisco State University
SFSU's Geography Department and Institute for Geographic Information Science provided infrastructure support. The workshop was taught in the Geography Department's GIS classroom (HSS 290): a state-of-the-art facility with the appropriate software licenses, individual working areas, powerful computers for each participant, an overhead projection system, and comfortable discussion space. On-campus housing was made available by SFSU in apartments and dormitories. The lending library of ESRI Press books was housed in the Geography Department map library immediately adjacent to the teaching laboratory. The workshop reception was held in the Blakeslee Room ù a university facility often used for this purpose.

The University assisted the project financially by not charging overhead on the subcontract and by front ending expenditures on project development and implementation for reimbursement from the SPACE subcontract to UCGIS later.

Professor LeGates and his colleagues worked collaboratively with the SPACE staff at UCSB to create appropriate web infrastructure for offering the SFSU workshop.

Other Collaborators or Contacts

Luc Anselin (Spatial Analysis Laboratory, Department of Geography, University of Illinois, Urbana-Champaign) provided copies of the GeoDa software for exploratory spatial data analysis for all space workshop participants -- on disk for the UCSB workshop and as a free download from https://geoda.uiuc.edu for participants in the other workshops. The GeoDa software was featured as a tool for direct application in undergraduate social science courses in the UCSB 2004/2005 workshops, in the OSU 2005 workshop, and in the 2004 SDSU workshops.

Intergraph Inc. provided one-year trial licenses of their GeoMedia Professional GIS software for all SPACE workshop participants in 2004, along with information on the Intergraph program for educational support.

The ESRI Press provided a complimentary library of fifteen publications on GIS applications in the social sciences for each of the three SPACE workshops in 2004 (approximate retail value $2,000); and supplemented this with an additional 5 books in 2005. ESRI also donated 1-year licenses of ArcGIS 9.0 to all participants in the 2005 workshops at UCSB and SFSU.

Clark Labs (Clark University) provided evaluation copies of its Kilimanjaro Idrisi GIS software for workshop participants in each of the 2004 SPACE workshops.

The **Department of Geography, University of California, Santa Barbara**, provided a lecture room, a computer lab with 24 fully equipped computers, and technical assistance for the two-week-long workshop at UCSB in 2004 and in 2005.

Activities and Findings

Research and Education Activities

Training and Development:
The SPACE project employs graduate students at each of the host institutions to assist with the organization and delivery of instructional materials. The graduate students have gained appreciation for how to design materials with clear instructions, how to assist in the instruction of labs and tutorials, and how to work with university professors from a variety of disciplines and different types of educational institutions. In working with workshop participants over the course of one or two weeks, they have acquired contacts within the academic teaching and research communities. Eleven graduate students and one Post Doc assisted in the development and administration of the SPACE project during its first year. In year two, 8 graduate students and three undergraduate students worked in the project, creating lab exercises, teaching in the labs, handling general workshop logistics.

Specific examples include:
- A PhD candidate in Anthropology (Eric White), with expertise in the design of customized search engines, helped in the search and organization of educational development resources. These include links to course syllabi that demonstrate instructional strategies for using spatial analysis in a range of social science disciplines. He also gained familiarity tools for the assessment of learning, discovering resources that e are currently featured on the website.

- An Environmental Science and Geography student (Stacy Rebich), with a strong interest in education, played a significant role in the project, helping to design survey instruments used in evaluating applicants for selection as workshop participants and in the development of entry and exit surveys to evaluate the program and to assess progress made by participants. She also assisted with instruction and in one-on-one discussions with participants about their pedagogical goals and projects during the workshops at SDSU (2004), SFSU (2005), and UCSB (2004 and 2005).

- A PhD student in geography (Jeff Howarth) helped to develop a tool for assessing various GIS software that workshop participants might consider for use in their undergraduate teaching. He gave a presentation on this to the UCSB workshop (2004) and, based on feedback from participants, the GIS selection guide is now a resource

available on the SPACE website - At San Diego State University, a PhD candidate (Jared Aldstadt) designed the exercises and taught the lab component of the workshop for the use of GeoDA -- an exploratory spatial data software package for spatial econometrics. This software, an outcome of the CSISS program, was provided to all workshop participants for use in both teaching and research.

- At Ohio State University, Eric Boschmann and Fang Ren played lead roles in workshop management in 2004 and contributed to instruction about workshop lab exercises. In doing so, they and several other graduate students acquired an appreciation of the benefits and challenges of cross-discipline communication, awareness of different teaching issues, and exposure to different disciplinary perspectives on applications of spatial analytic methods. In 2005, Jason Van Horn and Suzanna Klaf assumed these duties.

At SFSU, an undergraduate film major was hired to produce a short documentary film on the workshop and its participants. This will be featured in presentations to the SPACE planning meeting in December 2005 and to a special session on the SPACE program at the 2006 summer Assembly of UCGIS.

Workshop coordinators and primary instructors also benefited for the very same reasons noted for graduate students.

Outreach Activities:
Although project activities are oriented largely to serving university undergraduate social science instructors in the United States, the dissemination of project resources has invited unexpected outreach opportunities to share the science of spatial analysis. For example, the SPACE website has opened communications with a broad public of diverse interests. Inquiries arrive regularly from high school teachers, university instructors from outside the social sciences, and students from across the country and from abroad. A few workshop instructors have been invited by participants to meet with environmental agencies and community interest groups and to give guest presentations at academic institutions.

Advertising for SPACE targeted fliers and email announcements to designated minority institutions. The program also provided supplemental funding for minority participants – two Hispanic American and three African American workshop participants received support under this initiative in 2004. In 2005, the number of African American participants and instructors from HBCU and Hispanic Serving Institutions expanded significantly – to 17 of 67 total participants (25%). In addition, the project supported one participant from the developing region of Assam in India in 2004 û an international outreach that also enriched the workshop experience for other participants.

SPACE workshops are intended to have results beyond local campuses through the local outreach efforts of the workshop participants and their institutions. More than a dozen of the 2004 participants have made conference presentations that draw on their experiences in SPACE workshops; some of them have organized forums on their own campuses to expose other faculty to the potentials of spatial analytic methods in teaching and research. Some – described elsewhere in this report – have organized conference sessions and workshops on education development issues with financial support from the SPACE program. SPACE will continue this program to fund participant initiatives at conferences in their disciplines in year three.

Books or Other One-time Publications:
Donald G. Janelle, *Spatial Social Science*, (2004). Booklet, 16 pages, Published
Bibliography: Center for Spatially Integrated Social Science, University of California, Santa Barbara

Donald G. Janelle, "GIS Instruction in the Social Sciences", (2006). Chapter in Book, Accepted
Editor(s): Diana Sinton and Jenni Lund
Collection: *A Place for GIS in the Liberal Arts*
Bibliography: Redlands, CA: ESRI Press

Web/Internet Site:
URL(s):
www.csiss.org/SPACE
Description:

The SPACE website is a principal means of advertising the workshop program, it is the primary means for submitting applications to participate in workshops, and it is used to administer the program. Workshop instructors use a secure database on the site to evaluate applicants and to make decisions on admission. The site conveys information about workshop agenda and logistics and it is a repository of resources for workshop participants (example syllabi, learning materials, assessment instruments, etc.). In 2005, the website was enhanced to search for discipline-based instructional resources and to display resources and details on initiatives created by workshop participants to share with others over the Web. Back-end databases provide the means for administering web-based entry and exit surveys. See "Findings" section for detailed information on the actual use of the SPACE website.

Other Specific Products:
Product Type:
SPACE program flier
Product Description:
A two-sided bi-fold brochure describing the SPACE program and resources for use in introducing spatial analysis to undergraduate social science students was produced in 2005.
Sharing Information:
1500 copies of the brochure are available for distribution at workshops and through academic conferences attended by SPACE personnel and former participants in SPACE workshops in 2005 and 2006.

Contributions

Contributions within Discipline:
The host discipline for this project is arguably Geography. However, the project's origin in the NSF-supported Center for Spatially Integrated Social Science enhances the importance of original instructional contributions from scholars in a range of disciplines. Accordingly, aside from Geography, SPACE workshop instructors have academic origins in other social science disciplines (e.g., John Weeks, coordinator for the workshop at SDSU, is a Demographer; Stuart Sweeney, coordinator for the workshop at UCSB, holds degrees in Urban and Regional Planning; Richard LeGates, coordinator of the SFSU workshop is an urban planner; and Fiona Goodchild, the Educational Development Coordinator for SPACE, has degrees in History, Education, and Psychology). Most of the featured guest lecturers came from outside of the discipline of geography - anthropology, economics, environmental studies, health studies, and sociology. Workshop participants from this broad range of social science disciplines are expected to use the workshop experience to engage actively in exposing their students to the importance of spatial thinking in tackling a wide variety of social science problems. Spatially integrated social science (SISS) derives its principles and practices from the integration of spatial analytical methods with the theories and thematic problems of the social sciences (Goodchild and Janelle, editors, 2004. *Spatially Integrated Social Science*, Oxford University Press). SISS is based on the premise that a wide variety of social processes and problems are more clearly understood through the mapping of phenomena and the analysis of spatial patterns. The locational properties of information are often obscured in tabular formats that are traditional to most social sciences. Maps permit the visualization of this information to reveal patterns and trends not easily seen in a table. Spatial association, regional differentiation, diffusion, spatial interaction, and pattern detection are key concepts of spatial thinking. Through applications of analytical cartography, spatial statistics, spatial econometrics, and geographic information systems (GIS), these concepts facilitate the integration of theory with empirical analyses and aid both the interpretation of research findings and the presentation of research results. The integration perspective of SISS focuses on location as a natural basis for ordering and combining diverse information sources and for seeing the resolution of social science problems as fundamentally multi-discipline in character. For example, GIS and other spatial tools can facilitate an integration of perspectives from several disciplines (e.g., anthropology, economics, geography, political science, and sociology) to help understand social processes such as economic globalization or gentrification. Confining investigations of such issues to the realm of one discipline fails to capture the complexity of processes and interactions across geographic scales. Some examples follow:

- Maps of environmental quality and human health can be overlaid to examine correlations that may suggest clues for further research.
- The territorial division of cities, based on ethnicity, demographic processes and social class, can be analyzed spatially as a key driver of social changes and as a basis for assessing social needs.
- Public health researchers are concerned with contagion effects in the spread of diseases.

- Changes in public opinion may reflect social diffusion processes that underlie spatial patterns of political movements, shifts in value systems, and changing norms of human behavior.
- Cartographic visualization of these processes through animated maps represents one method to depict temporal patterns in the geographic spread of such phenomena.
- The analysis and modeling of spatial flows is an important focus for resolving problems in transportation studies, in explaining trade patterns in relationship to regional development issues, and in understanding demographic changes that alter the demand for social services.
- Physical arrangement and clustering of phenomena are keys to pattern detection - for identifying the patterns of crime occurrences in cities and in being able to discern whether such patterns arise by chance or through some underlying associations of social and economic conditions that occur within regions and their surrounding areas.

Imparting these ideas and skills to undergraduates will yield significant benefits to their further education and to the knowledge that they will bring to their post-university careers.

A special section of the SPACE website was developed in 2005 to feature contributions from 2004 workshop participants. This resource currently features examples of instructional innovations (new course syllabi, student exercises, assessment practices, etc.) from instructors in archaeology, communication studies, economics, environmental studies, human geography, sociology, and urban studies. Additional contributions will be solicited from 2005 workshop participants. These resources provide examples that other instructors can review and build upon for their own courses. They are very helpful for workshop participants looking for guidance on what they might do to foster spatial analytic skills in their instructional programs.

Contributions to Other Disciplines:
SPACE sponsors a special program to foster spatial perspectives broadly across a range of disciplines. Its Academic Conference Courses to Enhance Spatial Science (ACCESS) program has funded the following initiatives in 2005 and 2006:

(1) Symposium: Integrating Geospatial Perspectives and Education in Archaeology, Society for American Archaeology in San Juan, Puerto Rico, April 2006. This is organized by prior participants in the OSU 2004 workshop and in the 2005 UCSB workshop -- Veronica Arias, Heather Richards, and Judith van der Elst (all from the University of New Mexico).

(2) Workshop: Integrating GIS and Spatial Analysis into the Undergraduate Planning Curriculum, Association of Collegiate Schools of Planning, in Charleston, South Carolina, October 2005. Richard LeGates (SFSU SPACE workshop leader in 2005) and Stuart Sweeney (UCSB SPACE workshop coordinator in 2004 and 2005) are the primary leaders.

(3) Demonstration Workshop: GIS, GPS, and Spatial Analysis Tools in Support of Service Learning, National Technology and Social Science Conference, in Lass Vegas, NV, April 2005. David Padgett, a participant in the 2004 UCSB SPACE workshop was the organizer and instructor.

(4) Panel Session: GIS and Spatial Analysis Tools to Enhance Social Science Course Content and Research, Association of Social and Behavioral Scientist, Nashville, TN, March 2005. David Padgett and Nikitah (participant in the 2004 OSU SPACE workshop) organized this session to help enhance knowledge about the SPACE program across the historically black colleges and universities.

Over the past two years, several workshop participants (approximately 25 percent) were from disciplines that apply social science perspectives in their study areas – criminology, public policy and management, environmental policy studies, health studies, tourism and recreational resource management, and urban and regional planning. Our investigations indicate that these are areas that are making significant strides in recent applications of spatial methodologies in research. However, instructional uses of GIS and spatial statistics are only recently making their way into curricula. The SPACE program offers focused exposure to both the methods of analysis and the instructional issues that must be understood to introduce these powerful tools within the university curricula of these more applied areas of the social sciences.

In September 2005, the SPACE PI gave a presentation to more than 100 participants in the annual Crime Mapping Research Conference, hosted by the U.S. Department of Justice's National Institute of Justice, in Savannah.

Other examples of outreach include:
-Richard Appelbaum's (SPACE co-PI) presentation on the SPACE workshop program to the August 2004 annual meeting of the American Sociological Association, in San Francisco.
-Don Janelle's presentation strategies for implementing GIS in the social science curricula to the November 2004 annual meeting of the multi-disciplinary Social Science History Association, in Chicago.

Contributions to Human Resource Development:
The dissemination of spatial technologies among undergraduates has the potential to enhance the conceptualizing of problems by students in several social science disciplines, providing them with new tools to explore and process information for use in studying societal and environmental issues. Since many of the participants in the SPACE workshops are from applied disciplines (such as urban planning, criminology, and health studies), it is anticipated that the spatial conceptualization and analysis of problems will become more widely distributed skills in the workforce. Many of the participants indicated their intention to engage undergraduate students in group projects that would require the teamwork and experience with spatial analytic tools that is increasingly important for many jobs (in business, policing, investment assessment, etc). The concepts and skills imparted by SPACE workshop participants to their undergraduate students will intensify the diffusion into an even greater variety of work and study environments in the years to come.

The participant contribution section of the SPACE website provides examples of what students trained to think spatially in such disciplines as economics, human geography, and sociology are capable of after completing new courses offered by prior SPACE workshop participants.

Contributions to Resources for Research and Education:
Since SPACE is focused on the national dissemination of existing spatial technologies within undergraduate social science education, it has also engaged in consolidating resources at www.csiss.org/SPACE to make it easier for busy educators to access information resources that they might find difficult to uncover on their own. For example, in establishing a collection of discipline-based syllabi from educators who teach spatial analysis, instructors who are contemplating the adopting of spatial components in their courses have a place to turn to for ideas. SPACE has also opened communication with commercial vendors to help facilitate access to GIS software by instructors and institutions that have not yet moved in this direction.

SPACE provided each of the nearly 70 workshop participants in 2005 with a copy of the edited book 'Spatially Integrated Social Science' The editors (Goodchild and Janelle) waived all royalties and the publisher (Oxford University Press) provided its deepest level of discount to reduce the price of the book. Featuring 21 chapters of research examples from a dozen disciplines and interdisciplinary areas, it provides workshop participants with a timely resource and reference on applications of spatial analysis for classroom discussion. This will be repeated for the 2006 workshop program.

On the research front, the data collected via application forms and entry / exit / follow-up surveys will provide a rich set of resources for analyses on the pedagogic value of different approaches in structuring workshop programs and on their relative value in achieving national dissemination. At this point, the data are being used only for administering and evaluating the SPACE program. It will be necessary for the principal investigators to secure approval for research using human subjects in order to proceed with research investigations. In year three of the project 2006), the PI (Don Janelle), the Education Development Coordinator (Fiona Goodchild), and a graduate student (Stacy Rebich) will commence with a formal analysis of these data for presentation at conferences and for publications.

Contributions Beyond Science and Engineering:
Citizen groups increasingly use spatial technologies, such as GIS, GPS, and remote sensing. The emergence of a movement referred to as Public Participation GIS (PPGIS) demonstrates the perceived power associated with being spatially informed in how one characterizes and resolves societal issues. By seeking the dissemination of spatial

analytic methods among undergraduate students in a wide range of disciplines, the SPACE project helps indirectly to foster a more deeply informed use of these technologies. Spatial understanding is fraught with problems regarding scale, with alternative methods for the aggregation of data, and with difficulties in interpretation of spatial analytic results. Exposure to these concerns at the undergraduate level and from the perspective of the underlying theories of different disciplines will in the long run enhance significantly the spatial literacy of citizen groups and policy makers.

Don Janelle's presentation on the SPACE program to the Crime Mapping Research Conference in September 2005 reached practitioners of law enforcement from across the United States in addition to academic criminologists who teach undergraduate students going into the fields of law enforcement.

Special Requirements
Special reporting requirements: None
Change in Objectives or Scope: None
Unobligated funds: less than 20 percent of current funds
Animal, Human Subjects, Biohazards: None
Categories for which nothing is reported: Journal articles

NSF Division of Undergraduate Education (supplement to report)

NOTE: The NSF Division of Undergraduate Education seeks a supplemental report on pedagogic goals. Responses were automatically transferred from the Activities and Findings section of the general NSF report. In some cases (below), I changed these responses to reflect more clearly the specific headings of the supplemental form (e.g., Updated Project Description and Innovations or Unique Successes to Date). dj

Project Goal(s):

- Facilitate undergraduate faculty development in spatial social science
- Expand curricula resources in spatial social science
- Provide follow-through professional development
- Achieve diversity in access to educational opportunities
- Establish and encourage support networks
- Foster technology integration in undergraduate education
- Promote discipline integration
- National dissemination

Updated Project Description:

No major changes were requested. The UCGIS workshop in 2006 will be held at Oklahoma University and will feature Remote Sensing Applications in Social Science Instruction. The SPACE PI will work directly with the workshop coordinator, Dr. Tarek Rashed toward the implementation of SPACE workshop goals. He and three other instructors will participate in the December 2005 planning meeting in Santa Barbara. This meeting will be an occasion to review fully the experience of the past year in planning for summer 2006 workshop offerings and for web resource initiatives

Innovations or Unique Successes to Date:

The SPACE program effectively recruited young faculty from a range of social science disciplines. The application pool was impressive and diverse, especially in terms of the range of institutions that were represented. Not only were the faculty interested in learning more about spatial analysis and technology, but they were active in exploring how to integrate this approach into their undergraduate courses. Several comments on the final surveys indicated that the SPACE program provides a unique opportunity for faculty to compare notes and resources that will improve their credibility and potential to make innovations at their home institutions. One significant innovation in 2005 was to display the education resource developments of year 2004 workshop participants on the website so that others (including the 2005 workshop participants) might benefit from examples of pedagogic innovations from prior workshop participants.

Curricular Target(s) of Project:

SPACE has a specific goal to assist faculty in using new approaches to spatial analysis, including databases and software packages. Each of the summer workshops provided outstanding facilities and instruction that enabled the participants to the get hands-on experience that is critical in terms of preparing them to be innovative teachers.

At the end of the summer sessions, participants made presentations that reflected their current interest in engaging students in new exercises and projects. Some of these were better developed than others in terms of providing specific examples. Most of them indicated that they had gained confidence in being able to introduce GIS and GeoDa to their undergraduates.

Discipline(s) Affected by Project:

In the first two years of the project, participants were from:

- Anthropology
- Archaeology
- Business management
- Communication studies
- Community studies
- Criminology
- Demography

- Economics
- Education
- Epidemiology
- Geography (physical and human)
- Health studies
- History
- Humanities
- Landscape architecture
- Library science
- Public policy and management
- Psychology
- Regional science
- Sociology
- Technology studies
- Tourism and recreation management
- Urban and regional planning
- Urban studies

Subjects Affected by Project:

Participants have been interested in teaching spatial concepts in relationship to a broad base of subjects. Examples include:

- Criminal justice
- Environmental justice
- Globalization
- Health policy
- Immigration policy
- Poverty and inequality
- Regional development
- Social and ethnic segregation
- Urban gentrification
- etc.

Title(s) of Course(s) Affected by Project:

For the workshop entry surveys, participants were asked to list the courses that they taught over the past two years and to identify the courses that they are considering for inclusion of spatial analytic approaches. Given the diversity of the disciplines and subjects noted in the last two sections, the subjects are correspondingly varied. Specific examples are documented on the SPACE website under participant contributions -- showing detailed syllabi and course exercises designed by SPACE workshop participants in 2004. Example course titles and exercises reported by participants include:

- Geospatial Analysis in Archaeology (University of New Mexico)
- Resource Economics and Policy Applications of GIS (University of Maine)
- Environmental Conservation / exercises using GIS (University of Southern Illinois
- Urban and Regional Analysis / exercises using GIS (Gustavus Adolphus College)
- Communication and Social Change / exercises in mapping (Rutgers University)
- Introductory Spatial Analysis Using GeoDa in Economics / exercises (Hobart and Smith Colleges)
- Spatial Analysis of Environmental and Social Systems (Harvard University)
- Urban Geography / class demonstrations of GIS and GeoDa use (Tennessee State University)-GIS Applications in Law Enforcement (Methodist College)
- History and Philosophy of Geography / spatial analysis exercise based on land use modeling (Indiana University at Indianapolis)

Summary Description of Pedagogical Approaches:

In the first year of SPACE, we presented several sessions during the summer workshops that encouraged participants to focus on their objectives for student learning. We also varied the pedagogy of the summer workshops to illustrate the value of different types of instruction -- small group discussion, individual laboratory assignments,

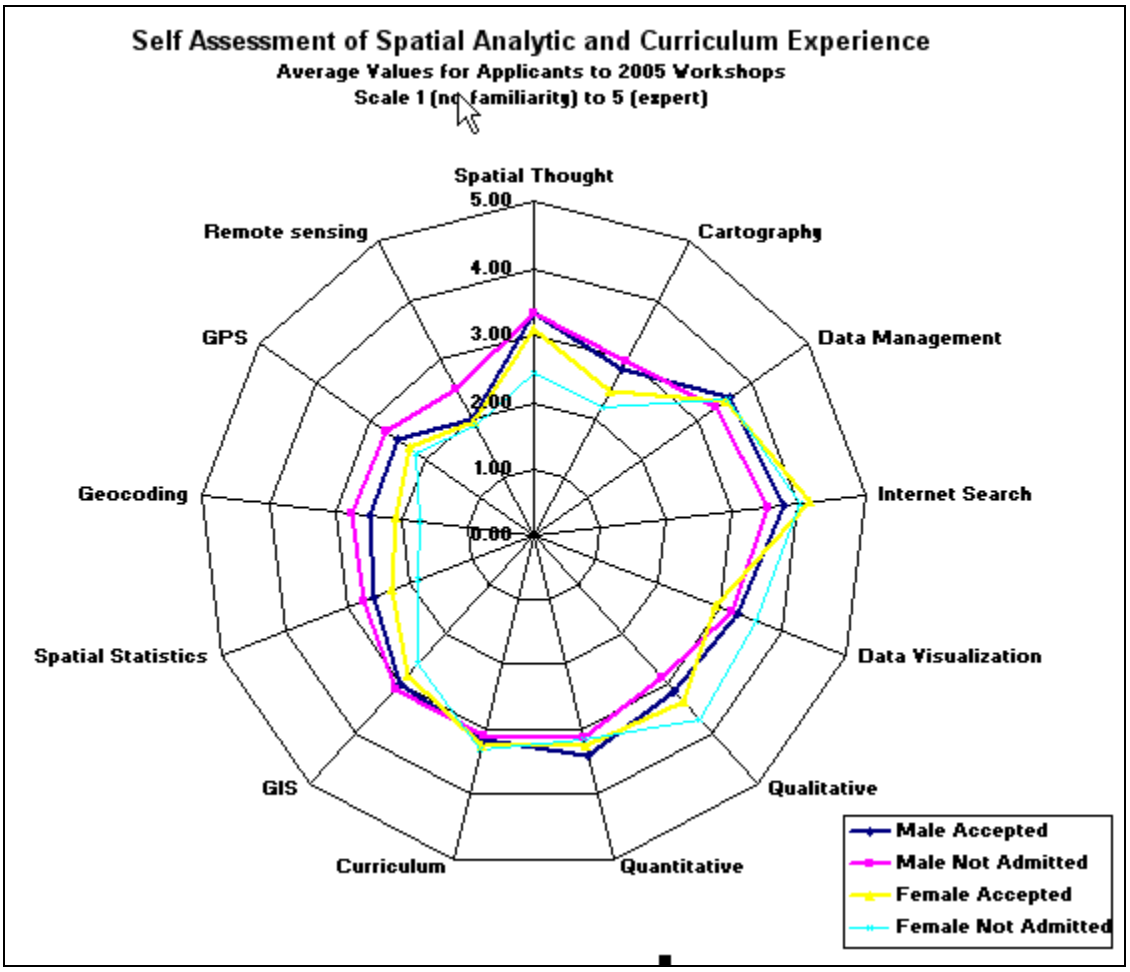
and lectures to achieve a variety of goals. It was clear that a few participants had experience in designing curricula that matched the content ideas with the assessment of student performance. However, many of the participants had not adopted this approach before, and several of them expressed interest in pursuing this aspect more extensively. This topic was on the agenda for the SPACE Planning Meeting in December 2004, resulting in a more concentrated emphasis on student learning objectives in the undergraduate curriculum in the 2005 summer workshops. Examples of related workshop resources are included in the 'Activities' section of this report.

Additional Sources of Funding:

The SPACE project has made use of resources created from NSF funding of the Center for Spatially Integrated Social Science (BCS 9978058)-- including GeoDa and FlowMapper (software created for exploratory spatial data analysis and for mapping data from interaction matrices). These packages are provided to the participants of the SPACE workshops and are featured in the workshops. In addition, learning resources (CSISS Classics and the GIS Cookbook) are cross-listed on the SPACE website and are widely used by SPACE workshop participants for self-learning and for sharing with their students.

Report submitted to the National Science Foundation
Donald G. Janelle
6 October 2005

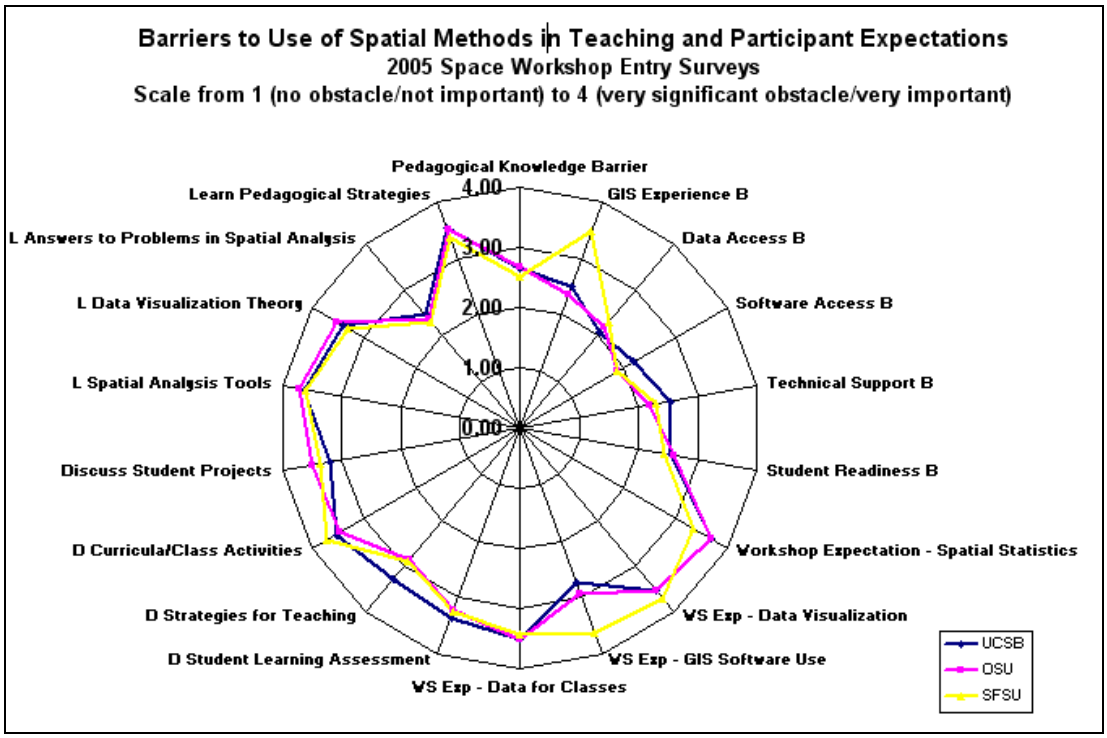
Applicant Self-Assessment for 2005 SPACE Workshops



Applicants' Self Assessment of Spatial Analytic Experience 2005
(Average Values -- See Application Form)

Experience	Participants			Not Admitted		Accepted	
Indicators	UCSB	OSU	SFSU	Female	Male	Female	Male
Spatial Thought	3.41	3.46	2.73	2.43	3.32	3.07	3.32
Cartography	2.91	3.00	2.05	2.14	2.96	2.45	2.82
Data Management	3.95	3.83	2.86	3.57	3.32	3.52	3.58
Internet Search	4.18	4.13	3.50	4.00	3.52	4.17	3.76
Visualization	3.45	3.50	2.36	3.57	3.16	2.93	3.26
Qualitative	3.36	2.63	3.77	3.71	2.84	3.34	3.13
Quantitative	3.68	3.46	2.86	3.14	3.12	3.24	3.37
Curriculum	3.18	2.79	3.59	3.29	3.08	3.24	3.13
GIS	3.36	3.33	2.00	2.57	3.08	2.83	3.00
Spatial Statistics	2.59	2.92	1.77	1.86	2.72	2.28	2.58
Geo-coding	2.50	2.83	1.55	1.71	2.76	2.10	2.47
GPS	2.45	2.88	1.77	2.14	2.68	2.28	2.47
Remote Sensing	2.14	2.33	1.32	1.86	2.48	1.93	1.97

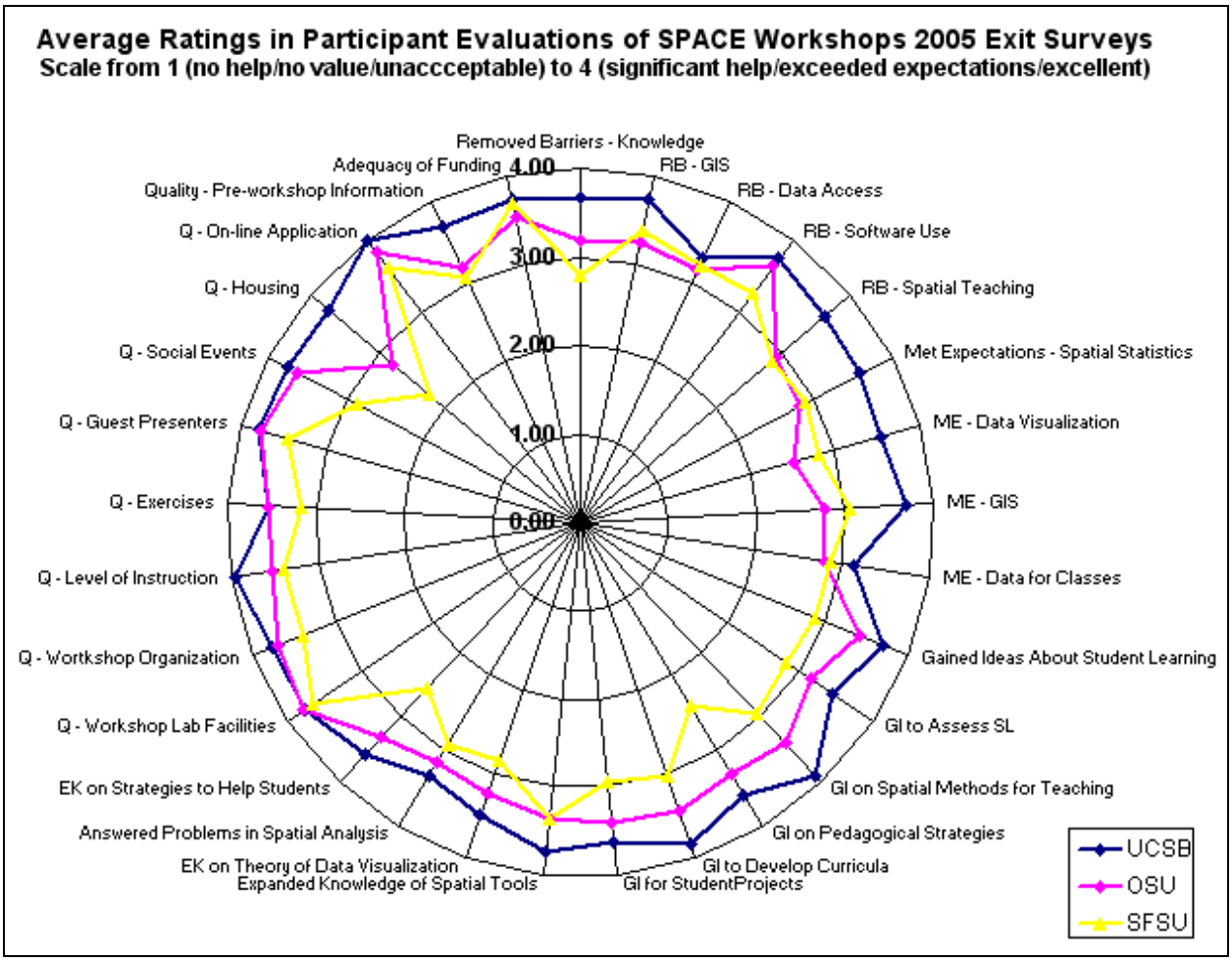
What Did Those Accepted into 2005 SPACE Workshops Perceive as Barriers and Expect as Workshop Outcomes?



Perceived Barriers to Spatial Analysis in Undergraduate Education and Expectations for SPACE Workshops by Participants (Averages on 1 to 4 scaling – See Entry Survey)

Year 2005	Averages by Workshop		
BARRIERS:	**UCSB**	**OSU**	**SFSU**
Pedagogical Knowledge	2.64	2.68	2.52
GIS Experience	2.50	2.36	3.48
Data Access	2.09	2.18	2.29
Software Access	2.18	1.86	1.86
Technical Support	2.55	2.18	2.29
Student Readiness	2.55	2.59	2.43
WORKSHOP EXPECTATIONS:			
Spatial Statistics	3.68	3.68	3.33
Data Visualization	3.50	3.55	3.71
GIS Software Use	2.73	2.95	3.62
Data for Classes	3.50	3.50	3.43
EXPECTATIONS FROM DISCUSSION WITH OTHER PARTICIPANTS:			
Student Learning Assessment	3.36	3.23	3.24
Strategies for Teaching	3.27	2.86	2.90
Curricula/Class Activities	3.55	3.45	3.71
Discuss Student Projects	3.23	3.50	3.38
EXPECTATIONS FROM WORKSHOP INSTRUCTORS:			
Spatial Analysis Tools	3.64	3.73	3.62
Data Visualization Theory	3.41	3.50	3.29
Answers to Problems in Spatial Analysis	2.45	2.36	2.29
Learn Pedagogical Strategies	3.55	3.50	3.38

How Did SPACE Workshop Participants Rate the 2005 Workshops?



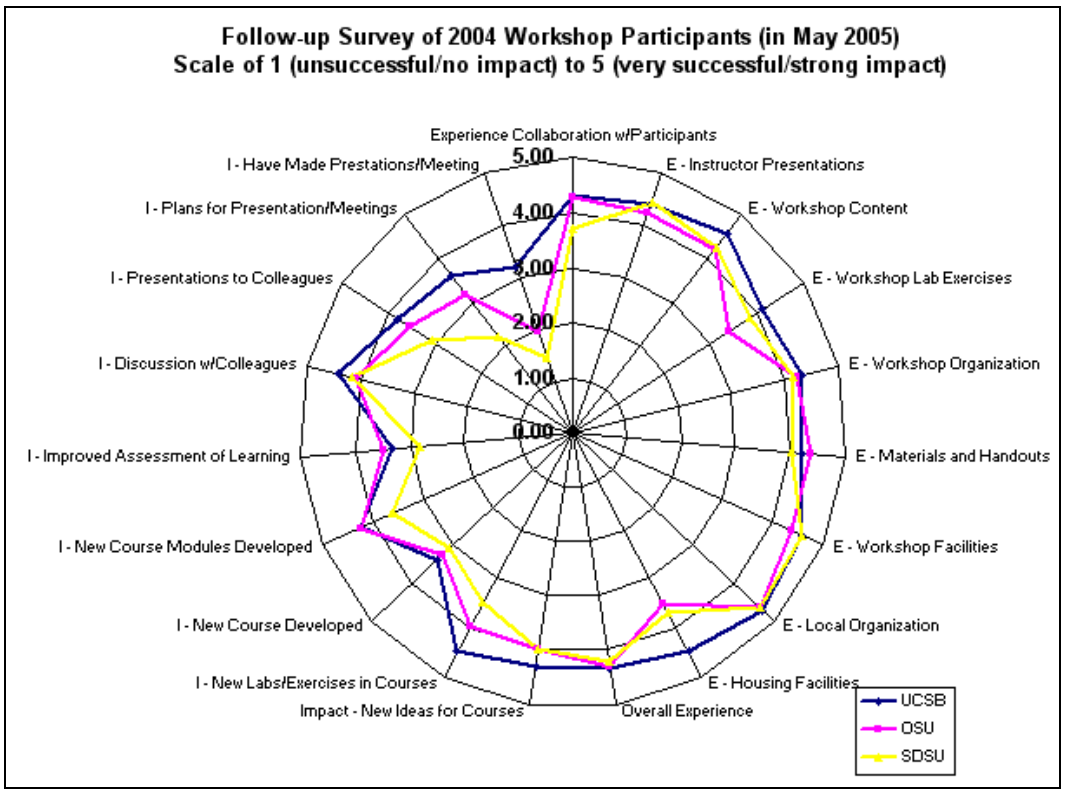
See table (next page)

HOW DID SPACE WORKSHOP PARTICIPANTS RATE THE 2005 SPACE WORKSHOPS?

Based on 1 to 4 Scaling of Questions on the Exit Surveys

Workshop:	UCSB	OSU	SFSU
REMOVED BARRIERS IN:			
Knowledge	3.67	3.18	2.79
GIS	3.73	3.23	3.37
Data Access	3.29	3.14	3.21
Software Use	3.73	3.64	3.26
Spatial Teaching	3.64	2.91	2.84
MET EXPECTATIONS IN:			
Spatial Statistics	3.57	2.82	2.88
Data Visualization	3.55	2.50	2.82
GIS	3.68	2.77	3.05
Data for Classes	3.14	2.82	2.89
GAINED IDEAS FORM DISCUSSIONS ABOUT:			
Student Learning	3.68	3.41	2.89
Assessment of Student Learning	3.45	3.14	2.82
Spatial Methods for Teaching	3.91	3.41	2.95
Pedagogical Strategies	3.59	3.32	2.42
Developing Curricula	3.82	3.45	3.00
Student Projects	3.64	3.41	2.95
FROM INSTRUCTORS:			
Expanded Knowledge of Spatial Tools	3.73	3.36	3.37
Learned Theory of Data Visualization	3.50	3.23	2.83
Answered Problems in Spatial Analysis	3.35	3.14	2.93
Learned Strategies to Help Students	3.59	3.32	2.56
QUALITY ASSESSMENT:			
Workshop Lab Facilities	3.76	3.77	3.67
Workshop Organization	3.77	3.68	3.39
Level of Instruction	3.95	3.55	3.41
Exercises	3.55	3.55	3.17
Guest Presenters	3.81	3.77	3.44
Social Events	3.75	3.64	2.87
Housing	3.74	2.77	2.25
On-line Application	4.00	3.82	3.61
Pre-workshop Information	3.70	3.18	3.06
Adequacy of Funding	3.74	3.55	3.69

How Did 2004 SPACE Workshop Participants Rate the Experience and the Impact of SPACE Workshops 10 Months After Completion?



Summer Workshops 2004 Follow-up Survey — Results

Measures	UCSB	OSU	SDSU
WORKSHOP EXPERIENCE			
Collaboration with participants	4.30	4.29	3.71
Instructor presentations	4.40	4.21	4.43
Workshop content	4.60	4.21	4.29
Workshop lab exercises	4.10	3.38	3.86
Workshop organization	4.30	4.21	4.14
Materials and handouts	4.20	4.36	4.00
Workshop facilities	4.60	4.36	4.57
Local organization	4.70	4.64	4.64
Housing facilities	4.50	3.50	3.69
Overall experience	4.33	4.31	4.21
IMPACTS OF WORKSHOPS			
New ideas for content in undergraduate courses	4.30	4.00	4.00
New labs or exercises for undergraduate courses	4.50	4.40	3.47
New courses for student learning about spatial analysis	3.40	3.23	3.07
New modules to engage undergrads in spatial analysis	4.20	4.23	3.60
Assessment of student ability to use spatial analysis	3.30	3.46	2.80
Discussion with teaching colleagues teaching spatial analysis	4.40	4.08	4.13
Presentations to colleagues about teaching spatial analysis	3.80	3.54	3.07
Plans for presentations about SPACE at professional meetings	3.60	3.15	2.20
Made presentation about SPACE at professional meeting	3.20	1.92	1.47