

UC Santa Barbara

Specialist Research Meetings—Papers and Reports

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Author

Appelbaum, Richard P.

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CSISS Specialist Meeting on Inequality & Equity

November 12-14, 2000

Overview of Workshop and Recommendations

Prepared by Richard P. Appelbaum

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In response to a recommendation by the CSISS Advisory Board at its May 5-6, 2000, meeting, CSISS held its first specialist meeting on November 13-14, 2000, in Santa Barbara. The purpose of the meeting was to identify ways in which CSISS could better achieve its goal of supporting the development and dissemination of spatial theories, tools, concepts and techniques in the social sciences, with reference to studying and addressing problems of social inequality and equity.

Background: Workshop Participants and Objectives

The workshop brought together twenty-one specialists from diverse disciplines (sociology, anthropology, criminology, political science, economics, geography, biostatistics, transportation engineering, and history), representing an equally diverse range of substantive interests in inequality which we categorized into four broad groupings: access, crime and social justice, urban inequality (including racial, and ethnic stratification), and economic inequality and labor markets. The meeting was co-chaired by Richard Appelbaum (Sociology and Global & International Studies, UCSB) and John Logan (Sociology, SUNY-Albany); the Steering Committee included Appelbaum and Logan, along with Helen Couclelis (Geography, UCSB) and John Sprague (Political Science, Washington University). A brief list of participants, their affiliations, disciplines, and interests is appended to this report. More detailed biographical information, as well as position papers written by participants, is available at <http://www.csiss.org/meetings/equity/equity.htm>.

The specific goals of the meeting were:

1. To identify **research questions** related to inequality and equity, where consideration of the spatial dimensions of the issues has led to, or is most likely to lead to, new insights. This includes the identification of issues requiring new developments in spatial theory, methodology or technology.
2. To identify **specific learning materials** and **best practice examples** that could be collected, developed, and disseminated by CSISS through its virtual community, to support research and instruction on the spatial aspects of inequality and equity.
3. To identify and prioritize **specific software tools**, including methods, statistical techniques, platforms, and implementations, that CSISS could refine or further develop to support research.
4. To suggest future CSISS **workshops**, based on the foregoing issues and concerns.
5. To suggest future CSISS **specialist meetings**, based on the foregoing issues and concerns.
6. To suggest **any other ideas** that would enable CSISS to better achieve its mission.

The workshop included a presentation on CSISS' virtual community (Don Janelle), software demonstrations on Spacestat (Luc Anselin), the use of public data (Bob Bennett), and the measurement of inequality (James Galbraith). The first day was spent largely in breakout sessions; the second in plenary. The workshop concluded with a discussion of three cross-cutting issues: problems of data and visualization; the use of public data (including confidentiality issues); and opportunities afforded by Census 2000 and Congressional redistricting.

Workshop Conclusions and Recommendations

As a follow-up to the workshop, we have emailed participants requesting additional suggestions, which will be included in this report as they become available. Conclusions and recommendations that emerged during the workshop itself are summarized in the pages that follow, grouped by the six meeting objectives:

1. Key issues in spatial theory, research, methodology and technology
2. Learning materials and best practices for virtual community
3. Software tools
4. Suggestions for future workshops
5. Suggestions for future specialist meetings
6. Other ideas and suggestions

1. Key issues in spatial theory, research, methodology and technology

Space should be made a more central, explicit concept in social science. This is already true of some disciplines (for example, human geography and, increasingly, anthropology), but in general, social theories need to be brought into spatial representation and analysis. Space could become the basis for the social science equivalent of the Hubble Telescope or Human Genome Project – an integrative framework that brings new understanding to diverse topics and disciplines. There are many sources of geo-referenced social science information available for this purpose, including data produced by state and local governmental agencies that are an untapped resource that could be used for this purpose.

Within the GIS paradigm, the center of activity needs to move from formal modeling of spatial processes with highly refined spatial statistics to relating these models more directly to underlying social processes. A key question is whether or how space or place themselves are explanatory variables, or whether they are merely proxies for unmeasured socioeconomic factors that should be directly modeled. Many socioeconomic concepts have not been conceptualized in formal spatial terms. How, for example, does one spatially define such terms as “vulnerability,” “inequality,” or “race” in a manner which makes them quantifiable and spatially-referenced for the purpose of GIS?

Beyond these conceptual issues, other specific issues identified by the workshop include:

- ♦ **Incorporating temporal considerations into spatial analysis:**
 - ♦ To what extent are temporal factors or analyses implicit or excluded from spatial questions and spatial techniques and technologies?
 - ♦ What are the problems in acquiring and analyzing longitudinal data in spatial analysis? Boundaries change over time...

- ♦ **Data-related problems:**
 - ♦ How to overcome the frequent disjuncture between the kinds of spatial analysis possible with available digital data sets, and the analysis required by one's theoretical/conceptual framework?
 - ♦ Lack of uniformity and consistency of social and economic data, including the need for more fine-grained geo-referenced data (or the absence of geo-referenced data altogether in some countries).
 - ♦ The perennial GIS problem of meaningful geographic units, and how to standardize analytic units when different research questions call for different scales.
 - ♦ Scale should be driven by theory, not data. Data at disparate levels of resolution – how can they be pulled together?
 - ♦ How to work with flawed data when such data problems can't be solved?

- ♦ **Statistical/technical problems:**
 - ♦ Reinventing the wheel with code – there is a lack of sharing and replication.
 - ♦ GIS software needs to include ways of displaying the statistical properties of data and distributions alongside thematic maps, so issues such as confidence intervals can be made transparent to the viewer.
 - ♦ Statistics behind maps need to be more up front in software, and not obscured in final output and presentations.
 - ♦ Capacity of software to work with extremely large datasets.
 - ♦ Integration of GIS with SPSS, spatial statistics, and data visualization software.
 - ♦ Integration of spreadsheets, SPSS, mapping, GIS, visualizing software.
 - ♦ Is there software to rectify different boundaries automatically?

- ♦ **Accessing and integrating data from different public entities/agencies:**
 - ♦ Getting permission to use data, particularly given concerns about confidentiality when individual names and location codes are used as the key identifiers.
 - ♦ Dealing with confidentiality and ethical issues.
 - ♦ Public Participation GIS: the cost of GIS is often too high for it to be used meaningfully by local groups.

- ♦ **Problems of visualization:** How to represent most effectively social forces/relationships in maps?
 - ♦ How can we make maps which display social rather than physical data? There is a need for analytical creative cartography for social science. Could CSISS develop a DVD/CD or website on map visualization for social scientists?
 - ♦ How can non-statistically oriented social scientists and historians, for whom space is a central (yet not formal) construct, be included in the push for spatial analysis? How to integrate qualitative approaches into spatial analysis?
 - ♦ The need for better spatial visualization outside the academic community: reading and communicating through maps, yet moving beyond simple maps. How can one make effective maps that are not deceptive – that reduce yet respect the underlying complexities? Conversely, how can one make effective maps that are explicitly polemical – that seek to make a point?

- How can maps be more effectively used to guide policy discussions? How can potential policy impacts be better visualized? Decision-making map tools are used in some fields (e.g., travel time maps used by transportation engineers) as a part of decision-support systems; this needs to be extended to other social science areas.
- How to incorporate/design maps/graphics for publication. What social science journals play a key role in publishing spatial analyses? Which publishers are more willing to publish high quality maps?
- How to better integrate cognitive mapping with GIS/spatial analyses? How to map the unmapable? How to analyze “fuzzy space?” How to incorporate multiple perspectives?

2. Learning materials and best practices for virtual community

A wide range of potential learning materials and best practice examples were identified by workshop participants, which will be incorporated into the CSISS website. One readily available source of learning materials are earlier NCGIA reports. It was suggested that CSISS identify 100 choice sites, perhaps rating their significance or providing a statement of why they were selected.

- **Websites of workshop participants include (preliminary list):**
 - James Galbraith’s University of Texas Inequality Project maps and data (<http://utip.gov.utexas.edu>)
 - John Kain’s UTD Texas School Project (www.utdallas.edu/research/greenctr)
 - John Sprague’s recent papers (numbers 370 and 392 from <http://artsci.wustl.edu/~polisci/papers.html>)
 - John Mollenkopf’s study of the “Rise and Fall of NYC’s Middle Class,” which examines patterns of income distribution (<http://www.council.nyc.ny.us/finance/middleclass.htm>); see also work on mapping crime hotspots
 - The Amadeus Project with data on household activities and mobility. Director: Harry Timmermans, Eindhoven University of Technology
- **Other websites:**
 - Neighborhood Knowledge, Los Angeles (<http://nkla.spsr.ucla.edu/>)
 - Minnesota State Representative Myron Orfield’s Minnesota Metropolitan Development Project; maps (on website) concerning segregation, designed to show inequalities; being used as policy tools maps for urban change
 - Waldo Tobler (UCSB Professor Emeritus, Geography): flow maps
 - Louisville-Jefferson County cooperative mapping site at <http://www.lojic.org/>
 - NYPIRG Community Mapping Assistance Project, <http://www.cmap.nypirg.org>
- **Best Practice Examples:**
 - William S. Cleveland’s *Visualizing Data*
 - Sjöberg, G., *The Pre-Industrial City*.
 - Jacobs, Jane, 1969, *Life and Death of Great American Cities*, London (Jonathan Cape).

- ♦ Pahl, R.E., 1975, *Whose City? and Further Essays on Urban Society*, Harmondsworth.
- ♦ M.J. Breheny (ed.), *Sustainable Development and Urban Form*, London (Pion).
- ♦ Garreau, J., 1991, *Edge Cities: Life on the New Frontier*, New York (Doubleday).
- ♦ Graham, S. & S. Marvin, 1986, *Telecommunications and the City: Electronic Spaces, Urban Places*, London (Routledge).
- ♦ Castells, M., 1989, *The Informational City: Information Technology, Economic Restructuring and the Urban-Regional Process*, Cambridge Mass (Basil Blackwell).
- ♦ Sassen, S., 1991, *The Global City: New York, London, Tokyo*, Princeton NJ (Princeton University Press).
- ♦ Carol Kohfeld, John Sprague, and S. Kristi Walker. 1999. "Objective Bases for Racial Stereotypes: The Fundamental Irrelevance of the Correlation between Race and Homicide," Prepared for delivery at the Annual Meeting of the Midwest Political Science Association (April 16-18). St. Louis: Washington University, Political Science paper Number 370 (see also papers by Sprague, Kohfield, and others at <http://artsci.wustl.edu/~polisci/papers.html>)
- ♦ La Vigne, N.G. and Wartell, J. (1988, 1999). *Crime Mapping Case Studies: Successes in the Field*, Volumes 1 and 2. Washington: Police Executive Research Form
- ♦ Victor Goldsmith, Philip McGuire, John Mollenkopf, and Timothy Ross, eds, *Analyzing Crime Patterns: Frontiers of Practice*. Thousand Oaks, CA: Sage Publications.
- ♦ Integrated Digital Archives (IDA) (for Los Angeles region), which describes itself as "a digital archive of materials in multiple information formats linked through a space/time/text/format indexing system. IDA is projected to become a comprehensive collection of texts, photographs, maps, audio-video, demographic and scientific data, and other information" (<http://www.usc.edu/isd/locations/cst/IDA/>)
- ♦ Mobley, Lee and Frech, H.E. III, "Managed Care, Distance Traveled, and Hospital Market Definition", *Inquiry*, v 37 (1)(Spring 2000), pp 91-107
- ♦ Bithell, J.F. 1990. "An application of density estimation to geographical epidemiology," *Statistics in Medicine* 9:691-701.
- ♦ Gatrell, A.C., T.C.Bailey, P.J.Diggle, and B.S. Rowlingson. 1996. "Spatial point pattern analysis and its application in geographical epidemiology," *Transactions, Institute of British Geographers* NS 21:256-274.
- ♦ Gelman, A. and P.N. Price. 1999. "All maps of parameter estimates are misleading," *Statistics in Medicine* 18:3221-3234.

3. Software tools

Various software tools (including methods, statistical techniques, platforms, and implementations) were mentioned during the course of the workshop. Some of these are freeware; it was suggested that CSISS distribute useful freeware through its website. While many of the following will require further research before receiving CSISS' endorsement, the following list is provided for reference purposes:

- ♦ Index measures of segregation/concentration/integration (dissimilarity, Gini Coefficient, Atkinson's inequality measure, Plato's ratio)

- ♦ Gary King's Ecological Inference maximum likelihood technique – see Gary King, *A Solution to the Ecological Inference Problem*, Princeton: Princeton University Press, 1997, [*A Solution to the Ecological Inference Problem: Reconstructing Individual Behavior from Aggregate Data*](#)
- ♦ Atlas GIS
- ♦ CrimeStat – spatial statistics, released in 1998 (version 1.1 in 2000) <http://www.ojp.usdoj.gov/cmrc/tools/welcome.html#crimestat>
- ♦ Moran's I
- ♦ Justice Index (G Jasso), developed for STATA; could be incorporated into spatial analysis software
- ♦ Markov Chain Monte Carlo – Bayesian approaches
- ♦ Combining GIS with neural networks and spatial econometrics
- ♦ Theil's T Statistic re levels of inequality (see <http://utip.gov.utexas.edu>)
- ♦ Data conversion software (e.g., web to spreadsheet), such as StatTransfer, DBMS Copy (see e.g. http://www.conceptual.com/demos/dbmscopy_demo_v7.exe)

4. Suggestions for future workshops

- ♦ **Data visualization:** instructing social scientists in cartography and visualization – the power implicit in cartographic representations. Topics could include:
 - ♦ creative map making that communicates effectively to particular audiences, including academics, community activists, policy-makers, etc.
 - ♦ space-time visualization
 - ♦ making good multivariate maps that convey complex information effectively
 - ♦ mapping flows
- ♦ **Public human service data systems**
 - ♦ What data are available, and how can it be obtained and integrated?
 - ♦ Training agencies/personnel who have access to confidential data on how to add and/or improve spatial analyses in their repertoire of work.
 - ♦ Developing methodologies for sharing and analyzing human service agency operating data with academic analysts.
 - ♦ Creating and using area-based public policy data libraries.
- ♦ **Explanation issues for spatial pattern analysis**
 - ♦ Linking spatial patterns with hypothesis testing whereby cognitions are translated into attitudes and behaviors
 - ♦ Involve environmental and social psychologists
- ♦ **Methodological aspects of small area studies**
 - ♦ Methods for disease mapping at small-area geographic scale
 - ♦ Multi-level modeling at the individual level of health outcomes
 - ♦ Appending geocodes to survey data and using them to add geographic contextual variables for subsequent analysis

- ♦ See, e.g., the National Small Area Analysis Workshop hosted by the New Zealand Public Health Services' Population Health Analyses and District Health Boards (<http://www.moh.govt.nz/forums.html>)
- ♦ **Integrating economic inequality statistics/models and GIS**
- ♦ **Training workshop on CrimeStat** (again, see <http://www.ojp.usdoj.gov/cmrc/tools/welcome.html#crimestat>)
- ♦ Workshop on Space at the crossroads of virtual and real infrastructures: What theories could explain the changes in behavior of people and business and the spatial impacts of the ICT-revolution?

5. Suggestions for future specialist meetings

- ♦ **Census 2000, Congressional Redistricting, and Related Geocoding.** The initial release of Census data will take place through the PL94-171 data file released after January 1, 2001 to the 50 state redistricting liaisons; the 2000 Tiger File will be released soon. States and localities will undertake redistricting of legislative boundaries in time for the 2002 Congressional elections and 2001, 2002, and 2003 local elections. (Census blocks form the basis for precincts). Considerations include:
 - ♦ Changes in the census format; changes in laws governing redistricting
 - ♦ Data capture and boundary capture for redistricting is important, since much of this is otherwise lost to researchers -- could be important to work in political geography, electoral research.
 - ♦ Redistricting software utilizes GIS (e.g., AutoBound, ESRI's redistricting package, Caliper's redistricting package; firms could give demos of their software)
 - ♦ Bernie Grofman – UCI School of Social Sciences – expert on redistricting; also Richard Engstrom (University of New Orleans); also, contact National Council of State Legislators.
 - ♦ Justice Dept collects data from across country to review for standards and national compliance – could Justice participate?
 - ♦ Equity issues stem from the fact that the redistricting algorithms include many non-eligible voters (recent immigrants who are not citizens) – hollow precincts that could reinforce the position of an elite minority. Who benefits from redistricting?
 - ♦ There is some concern for degradation of Census re: utility for researchers. E.g., altering income or education categories, small area suppression issues. the decennial census will shift to a rolling sample (panel of 50,000 per month)? How would social science community adapt to this change in data? Will PUMS be weakened? See ESRI website on census 2000.
 - ♦ Major opportunity to showcase GIS for various interested groups, including community groups.
 - ♦ Expert meeting could also include a focus on the ecological analysis of electoral/political behavior.
 - ♦ Potential (partial) funding for expert meeting: NSF Geography and Political Science directors?

- ♦ **Data Integration and Public access:** There is a wealth of local data collected by state and local agencies, which can be coordinated into databases and used for spatially-referenced social science analysis. There are a handful of local organizations (such as Research Development Associates in the San Francisco/East Bay Area of California) that have taken the lead in this; a workshop could be organized around their efforts. Integrating and coordinating such data would enhance academic access to such data, as well as community and local governmental use. The expert meeting should have strong community participation, as well as involving academics and other experts.
 - ♦ Potential participants: the Association of Public Data Users (APDU) <http://www.apdu.org/>; the National Community Building Network (<http://www.ncbn.org/docs/home/index.htm>); Ken Prewitt (Census Bureau Director); RDA Associates; the National Neighborhood Indicators Project (Claudia Coleman – Case Western).
 - ♦ Seek foundation support for building these data infrastructures; possibly Robert Woods Johnson Foundation; also possibly the Urban Institute’s Neighborhood Funding Group
 - ♦ Issues of confidentiality are central; standards needed to govern confidentiality and data-sharing; there is a lack of trust among local agencies that needs to be overcome.
 - ♦ Help communities link their own data with commercial software.
 - ♦ There are local research centers that are interested in making data available for community groups; CSISS could provide them with lists of sources, as well as publicity for their sites, creating an educational tool for localities.
 - ♦ Creation of a “data lab” that would enable community organizations to input their own data, and integrate with commercial GIS software.
 - ♦ Could CSISS create a national association to develop local data resources and on-going locally-based data systems? Should there be a national (U.S. government?) initiative to further data integration? Set national standards for community data? Would the federal government help finance community-based information systems?

- ♦ **Changing spatial paradigms as a result of the ICT revolution:** People are not only connected via real networks (transport networks) with the world, but simultaneously via virtual networks (ICT networks) as well. This has resulted in changing functions of home and office, spatial relations between housing and employment, and time-space-budgets of individuals and households. CSISS could organize a specialist meeting concerned with theoretical and substantive issues, as well as analytic tools to analyze such changes.

6. Other ideas and suggestions

A number of other suggestions were made for CSISS. These include:

- ♦ CSISS should undertake a “traveling road show,” linking with local sponsors to hold discussions, receive input, and identify local initiatives around the country.
- ♦ Involve CSISS in lobbying on relevant issues, such as potential changes in the Census, or federal guidelines that lead states and localities to strip locational information from certain kinds of data (such as health data). Should CSISS become involved in COSSA?

Participant List

Last name	First name	Affiliation	Discipline	Research interest
Appelbaum	Richard	UCSB	sociology	economic inequality, labor markets
Bennett	Bob	RDA Assoc.	sociology	urban services; public participation GIS
Conceicao	Pedro	U Texas	economics	economic inequality
Couclelis	Helen	UCSB	geography	information and communications technology (ICT), and inequality
Darden	Joe	Michigan State U	geography	racial inequality in cities
Galbraith	James	U Texas	economics	economic inequality
Gimpel	James	U Maryland	political science	political behavior; voting
Harthorn	Barbara	UCSB	anthropology	public health, medical; public participation GIS
Kain	John	U Texas	economics	spatial mismatch, market discrimination, race, schools
LaVigne	Nancy	US Gov't: NIJ	criminal justice	social justice, crime
Leitner	Helga	U Minnesota	geography	environmental inequality and justice
Logan	John	SUNY-Albany	sociology	urban inequality, race and class stratification
Louis	Tom	U Minnesota, RAND	biostatistics	public health, medical?
Mobley	Lee	Oakland U	economics	public health, health care, access
Mollenkopf	John	CUNY Grad Center	political science	urban inequality as a result of economic restructuring
O'Connor	Alice	UCSB	history	spatial mismatch, poverty, historical methods
Priemus	Hugo	Delft U, Netherlands	architecture and economics	ICT and inequality; housing, urban and mobility issues
Rushton	Gerard	U Iowa	geography	public health, medical
Sprague	John	Washington U	political science	social justice, crime
Walker	Barbara	UCSB	geography	GIS
Wong	Raymond	UCSB	sociology	urban inequality