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### Title

On the Possible Role(s) of a "University Consortium for Geographic Information and Analysis" (UCGIA) (92-6)

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**ON THE POSSIBLE ROLE(S) OF A  
“UNIVERSITY CONSORTIUM FOR GEOGRAPHIC  
INFORMATION AND ANALYSIS”  
(UCGIA)**

by

The UCGIA Steering Committee

NCGIA Report 92-6

# ON THE POSSIBLE ROLE(S) OF A "UNIVERSITY CONSORTIUM FOR GEOGRAPHIC INFORMATION AND ANALYSIS" (UCGIA)<sup>1</sup>

UCGIA Steering Committee<sup>2</sup>

## Abstract

Recently, the National Center for Geographic Information and Analysis (NCGIA) established an interdisciplinary steering committee to explore the concept of a "University Consortium for Geographic Information and Analysis" (UCGIA). A UCGIA could play a role in establishing a "national research agenda" for GIS and geographic analysis. The Steering Committee is investigating whether national coordination of research and educational activities could best be accomplished by an alliance of existing research and teaching organizations. The organization has been provisionally codenamed UCGIA, although an alternative name might be adopted if the organization is formed. In the draft statement, UCGIA would be an organization whose members are academic institutions-it is not seen as 'yet another GIS society'. The steering committee's goals are to develop alternative UCGIA concepts, prepare a document explaining one or more alternatives, present the concept of a UCGIA to the rest of the GIS/GIA community, evaluate whether UCGIA would serve significant needs of the discipline, and determine whether UCGIA or a similar consortium is achievable. If reactions and support are positive, a framework for instituting the consortium would also need to be established. In November 1992, a public panel discussion on the UCGIA concept was held at GIS/LIS'92. This paper presents a background, and then summarizes the panel discussion.

## Introduction

Geographic information systems (if broadly defined to include many aspects of land information systems, geographical analysis, cartography, geomatics, and remote sensing) is a multidisciplinary field. Recently, members of the NCGIA's Board of Directors (an oversight body composed of senior representatives of the academic community, government agencies, and industry) urged the NCGIA (National Center for Geographic Information and Analysis) to play a role in establishing a "national research agenda" for GIS and geographic analysis. NCGIA, however, has felt that such national coordination of research and educational activities would best be accomplished by a new alliance of existing research and teaching organizations. In light of this, the NCGIA extension proposal submitted to the National Science Foundation (NSF) in November 1991 included the following statement:

In the next year the Center will begin to explore the possibility of forming a consortium organization of major academic centers of GIS/GIA research in the US, to act as a framework for interaction within the academic community. The consortium has been provisionally codenamed UCGIA (University Consortium for Geographic Information and Analysis). We see it as functioning as an independent organization dedicated to working on behalf of the academic GIS/GIA research community; promoting community initiatives in curriculum development and evaluation; perhaps evaluating software for educational use; and many other activities for the common good of the academic research community. NCGIA might play a significant role in establishing UCGIA, but would have no special relationship with it thereafter.

In order to examine the need for such an organization and to evaluate alternative models for its nature and goals, early in 1992 several individuals were invited to participate in an interdisciplinary Steering Committee to explore the concept of a "University Consortium for Geographic Information and Analysis" (UCGIA). The members of the UCGIA Steering Committee are appended to this paper.

A UCGIA could play a role in establishing a "national research agenda" for GIS and geographic analysis, or in coordination of educational activities, or both. The steering committee's goals have been to develop alternative UCGIA concepts, prepare a document explaining one or more alternatives, present the concept of a UCGIA to the rest of the GIS/GIA community, evaluate whether UCGIA would serve significant needs of the discipline, and determine whether UCGIA or a similar consortium is achievable. If reactions and support are positive, a framework for instituting the consortium would also need to be established. In November 1992, a public panel discussion on the UCGIA concept was held at GIS/LIS'92 in San Jose, California. This paper constitutes a draft of the UCGIA Steering Committee's report.

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<sup>1</sup> This paper will appear in the proceedings of the American Congress on Surveying and Mapping's 1993 Spring Meeting.

<sup>2</sup> This article is the product of a committee, whose members are listed at the end of this article. Correspondence should be directed to David M. Mark, NCGIA, Department of Geography, SUNY Buffalo, Buffalo, NY 14261, whose electronic mail address is geodmm@ubvms.cc.buffalo.edu

### **Possible Roles for a 'UCGIA'**

UCGIA could have a role focused on the coordination of basic research, on educational activities, or both. The following lists of possible roles are only illustrative of the possibilities, and are in no way meant to be exhaustive.

In the basic research domain, UCGIA could:

- develop, revise, publicize, and update a prioritized national research agenda in GIS/GIA
- coordinate the development and dissemination of software platforms or shells for GIS/GIA research
- collect or develop and disseminate representative test data sets

In the educational domain, UCGIA could:

- develop, test, and disseminate curriculum materials
- evaluate and/or develop software for teaching
- negotiate with vendors on behalf of the academic sector (following the UK "CHEST" model)
- advise on setting up academic programs, teaching labs, etc.

### **Some Existing Organizations that may provide Models for a 'UCGIA'**

Several models exist for UCGIA, and so far we have examined two of these in some detail. The working name 'UCGIA' is based on UCAR (the University Corporation for Atmospheric Research). Another possible model is provided by OTS (Organization for Tropical Studies). Additional potential models have been identified and examined during 1992, and a concrete plan could be developed by adopting elements of several existing organizations or by developing new features, if the UCGIA concept is put into action.

**UCAR.** UCAR, the University Corporation for Atmospheric Research, a nonprofit consortium of 57 North American universities with graduate programs in atmospheric sciences, manages NCAR (the National Center for Atmospheric Research) under a cooperative agreement between the Foundation and UCAR. Located in Boulder, Colorado, NCAR provides a focal point for atmospheric research, and has about 650 scientists and support personnel. NCAR facilities serve the entire atmospheric sciences research community and part of the ocean sciences community. We do not foresee UCGIA as managing any large research facilities. However, one aspect of UCAR that may be worth emulating is that a University can become a member if and only if it has an established graduate research program of appropriate quality. UCAR has a Board consisting of two representatives of each member organization (one research scientist and one administrator); the Board meets once a year, and expenses are paid by UCAR, meaning that far-away members do not have to pay more to participate than close ones. Membership dues are less than \$2000 per institution per year.

**OTS.** The Organization for Tropical Studies was established about 30 years ago, to manage unique field stations in Costa Rica and to serve as a research focus. It is incorporated as a not-for-profit corporation in the State of Florida, where the founding organizers were located at that time. OTS currently has 52 member institutions, most of which are Universities in the United States, but some of which are independent research organizations. They soon expect to add their first Federal agency member (the US Forest Service). Member institutions must share common goals. New members are voted in by a Board of Directors, which consists of two representatives of each institution (so, 104 members at present). The Board meets once a year, usually in Costa Rica. The Board elects a 12-13 member Executive Committee (Chair, 2 vice-Chairs, others). That Executive Committee now meets 3 times a year (once with Board; two other times). The Executive Committee hires an Executive Director for the head office of OTS, located on the campus of Duke University in North Carolina, and also a Director for the San Jose office. OTS has two offices, one on the campus of Duke University and the other in San Jose, Costa Rica. OTS manages three field stations in Costa Rica, and conducts very few activities other than the field activities in Costa Rica. Annual membership dues were \$7400 in mid-1991. Member organizations are also 'required' to send at least one representative to the Board meeting at their expense. The main tangible benefit of membership is preferred access for students from member institutions to field ecology courses in Costa Rica. The research facilities are available to any bona fide researchers, and the user fees are the same for members and non-members. OTS has an annual budget of about \$1.5 million (1991), with about half coming from membership dues, user fees, etc., and the other half from grants from foundations and other funding agencies. Costa Rica member institutions are exempted from paying dues, but provide in-kind contributions at the field stations.

## Electronic Commentary by the Committee Members

In August 1992, some members of the Steering Committee met in Charleston, South Carolina. At that meeting, we decided to establish an electronic mail distribution list, that from August to November 1992 was a closed list consisting only of the members of the Steering Committee. (Subscription was opened to all interested parties in November 1992; see UCGIA-L section at the end of this paper.)

On October 22, 1992, we posted a list of questions about UCGIA, and asked the Steering Committee members to respond with materials suitable for publication in this report. This section includes most of the comments received.

### **The questions:**

#### *A. Questions from Mike Goodchild's GIS/LIS'92 panel proposal:*

1. "What would be the value of a national agenda in basic GIS research for the academic community?"
2. "Is there a need for a multidisciplinary organization of academic researchers in GIS, or other structures to support development of such an agenda?"
3. "How should the needs of applied research and development be incorporated?"
4. "How can such an agenda best serve the needs of the vendor, agency and user communities?"
5. "How can the basic research community act together to build funding support for such an agenda?"

#### *B. Some Other Questions:*

6. "Should an organization whose members are INSTITUTIONS be formed to coordinate research, education, and/or related issues in GIS and geographical analysis, or would national needs for coordination be better served by some combination of existing professional societies, or by a new GIS society with individual people as members?"
7. "Should there be membership criteria for UCGIA? If so, what should they be? If there should not be explicit criteria, should membership be open, or subject to a vote of existing member institutions?"
8. "Assuming that the UCGIA concept does go forward, can you suggest a better name for it than 'University Consortium for Geographic Information and Analysis'?"
9. "Should UCGIA be a U.S.-only organization (at least initially)? If not, should it be limited to North American institutions, or be global in scope?"
10. Please rank the following goals/tasks/services as possible parts of the 'mission statement' of the UCGIA:
  - A. Develop, prioritize, revise, publicize, and update a prioritized national research agenda in GIS/GIA.
  - B. Coordinate the development and dissemination of software platforms or shells for GIS/GIA research.
  - C. Collect or develop and disseminate representative test data sets.
  - D. Develop, test, and disseminate curriculum materials.
  - E. Evaluate and/or develop software for teaching.
  - F. Negotiate with vendors on behalf of the academic sector (following the UK "CHEST" model).
  - G. Advise on setting up academic programs, teaching labs, etc.
  - H. Offer focused advanced educational opportunities which may be more feasible for a consortium than a single university to support or are simply not available currently.

#### **Examples:**

1. Offer an annual project-oriented summer course which focuses each year on conceptual design for a new scientific research domain (e.g. bring together faculty and graduate students in GIS and archeology for an intensive twomonth for credit lecture/field experience in designing or applying geographic information systems to serve the needs of archeology. In other years it might be glaciology, biology, etc.)
2. Summer short courses in GIS for college teachers from a range of disciplines
3. Develop best of GIS graduate courses series taught by video or some other remote method.

*If you wish, please provide additional comments on each of these issues. Also, please suggest other goals that you think should be part of UCGIA's mission statement, but are not listed in the preceding section.*

11. "FROM THE PERSPECTIVE OF YOUR OWN DISCIPLINE (and perhaps subdiscipline), what do you see as the major potential advantages of an organization like UCGIA? And, what do you see as the major risks or dangers to your discipline or subdiscipline?"

## Randolph Franklin's responses to some of the questions:

1. "What would be the value of a national agenda in basic GIS research for the academic community?"

Franklin: Let me describe how a national agenda has helped another discipline which I am familiar with, computer science. Here the federal government has funded the development of some large system and then made it generally available. Examples include Berkeley Unix and the Arpanet. These projects benefit everyone but are too big for any one person to do without general support.

Private companies are ill-suited for basic research since the pay-back is too long, and since, even if they do it, they generally keep the results proprietary, so there is no direct benefit to the community, apart from the availability of a better commercial product.

Quite possibly we can identify areas of basic research where there is needed work that would benefit the whole community. This should be done at a national level since the results would be beneficial nationally.

2. "Is there a need for a multidisciplinary organization of academic researchers in GIS, or other structures to support development of such an agenda?"

Franklin: New disciplines and cross-disciplinary research suffer at the hands of the established subjects in fund-raising, and even in academic respect, which affects promotion and tenure. We need an organization to say that we have a substantial subject here, both in intellectual and practical terms. Again, I've seen the problems this has caused computer science. It seems that the biggest institutional enemy of CS has been Math, from which it grew.

3. "How should the needs of applied research and development be incorporated?"

Franklin: Our ideas should be embedded in demonstration projects, or even in publicly-available packages and systems. Since there are many packages and GISs of varying sizes freely available today, we must be careful that we are helping. If we were to encourage funding for a system 90% identical to some publicly available package, then that would be worse than a waste of the money, since we would discourage future independent efforts to develop systems.

4. "How can such an agenda best serve the needs of the vendor, agency and user communities?"

Franklin: If the research agenda produces generally useful results, theoretical and applied, then everyone benefits.

5. "How can the basic research community act together to build funding support for such an agenda?"

Franklin: One way to build funding support is to find a grand challenge. Physicists have been looking for controlled fusion for 50 years. Social scientists had the war on poverty. Biologists have the human genome project now. We must identify national problems where a large effort on our part could really help, and catch people's attention. The problem with this is that all the disciplines are doing this, so people are jaded. Nevertheless, if everyone but us does this, then we lose.

### B. Some Other Questions:

7. "Should there be membership criteria for UCGIA? If so, what should they be? If there should not be explicit criteria, should membership be open, or subject to a vote of existing member institutions?"

Franklin: Don't make the criteria too tight, or you'll exclude RPI. We have no GIS program, but we have researchers, such as George Nagy and myself working in the field.

10. Please rank the following goals/tasks/services as possible parts of the 'mission statement' of the UCGIA:

Franklin: All the proposed goals look worthwhile. Their relative worth depends on details. Which we actually pursue might even depend on which ones the most active volunteers want to work on.

11. "FROM THE PERSPECTIVE OF YOUR OWN DISCIPLINE (and perhaps subdiscipline), what do you see as the major potential advantages of an organization like UCGIA? And, what do you see as the major risks or dangers to your discipline or subdiscipline?"

Franklin: I described the advantages above in (2). The risks are that it might absorb people's time and money to no effect, and that we might set up a political structure controlling all the money and thwarting all new ideas.

### **Responses from John Bossier:**

Our ideas about the UCGIA are from somewhat of a different perspective than yours, although complementary. What follows is a glimpse of our initial thinking. "Our" is defined as the Center for Mapping and the Department of Geodetic Science and Surveying at OSU.

The following is divided into three parts:

- I Reasons for and against UCGIA
- II. Answers to some of your questions
- III. New questions

#### **I.a Reasons for UCGIA**

1. Strength in numbers for lobbying for research in GIS and related activities.
2. A forum for expanding, clarifying, dividing research programs and projects. For example, NCGIA research is focused in a spatial analysis context. The OSU Center for Mapping research agenda is toward developing a "total mapping system". Questions like, "is this division of research good, if not, what is better", need to be addressed. Perhaps a national research agenda could emerge whereby we divide the important problems and address our respective parts as a function of our expertise. Or vice-versa; we could agree to work together on certain things or a combination of both. The danger in such an arrangement is that control is possible and obviously undesirable (see 4 below). Cooperation should be the keystone of UCGIA.
3. UCGIA could be the national body favoring research in our disciplines and represent us in necessary situations. For example, I have been asked many times - "what organization is the (national) voice for GIS research in the U.S." Just two weeks ago, I had to name an entity to represent the U.S. I believe the NCGIA cannot (politically or substantively) play this role. The UCGIA can, especially if it is constructed properly.
4. The UCGIA would be far more interdisciplinary than the NCGIA and more open to unforeseeable developments in the future.

#### **I. Reasons against UCGIA**

1. I will resist (like a plague) setting up duplicate functions, (e.g., see your question number 11) to those now done by each of our organizations. We can coordinate, but setting up another organization to do what we already do is NO GOOD.
2. Is a UCGIA worthwhile? Is the  $RI = \text{Energy Out}/\text{Energy In} > 1$ ? Or is the  $R2 = B/C > 1$ ? We are all busy and we don't need more work. We have to determine this immediately and if we believe  $R1, 2, \dots, n < 1$  let's stop pursuing it.
4. Greater control of research, programs, grants is more likely, competition may shrink and as a result, competitiveness also.

#### **II. Answers to some of your questions**

Your questions understandably reflect an NCGIA flavor. This has strengths and weaknesses, however, it does bias the results. Nonetheless:

- A.
  1. The value of a national agenda is that GIS research would probably be enhanced and more total resources may become available. Also, defining a UCGIA (national) agenda would be enlightening and would broaden the present individual agendas.
  2. There is a need to broaden the present research agenda.

3., 4., 5., Seem to pertain to all of us now, not necessarily the UCGIA.

B. 6. The question is restrictive, other alternatives are possible. Professional societies have never been successful at building research agendas.

7. Membership issues are critical. Membership must be open within a set of guidelines which must be skillfully crafted. This is one of the most important issues. The criteria for initial membership could contain the following elements:

- a. "Institutional" scholarly achievement
- b. Critical GIS mass
- c. Interest
- d. Peer (NSF?) perception
- e. Other less exclusive criteria

Models exist (e.g., UNAVCO) for initial and follow on membership criteria.

8. The name "University Consortium for Geographic Information Science (UCGIS)" was suggested. It broadens the disciplines to include, say, data acquisition functions.

9. OSU feels that UCGIA should be only a U.S. organization initially. It may be desirable to broaden itself to North America at a later date.

10. It is premature to rank the items and they are a reflection of NCGIA programs. I am sure the UCGIA board will want to change these.

11. Answered in the beginning

### III. New questions

1. Is the UCGIA an NSF sponsored organization (like UNAVCO)?

2. What checks and balances should be implemented to minimize the controlling potential and maximize the coordination aspects of UCGIA?

3. The potential for a "closed" group is' great. Provide ideas for minimizing this potential (see your number 7 above).

4. Define what we mean by Geographic Information and Analysis in this context.

5. What synergy can be derived from a collective UCGIA effort?

6. What is the relationship between NCGIA and UCGIA?

7. If a national research agenda is to be defined, how closely should it follow the respective perceptions of the "national needs"?

### **Joe Ferreira of MIT wrote:**

My own opinion is that any UCGIA should start by focusing relatively narrowly on a limited agenda, with a structure along the lines of a 'consortium'. and with topics that involve spatial data infrastructure and SDSS-type research (i.e., attention to how GIS-related tools, theories, and technologies fit into a bigger world of decision support). For example, it could begin by focusing efforts on providing communication and coordination mechanisms that add interdisciplinary elements which could complement ongoing research at member sites. (Member sites need not be only academic universities). High speed Internet connections are just getting to the point where they can support useful access to GIS-based tools, models, datasets, etc. and the member sites tend to be homogeneous relative to the inter-disciplinary spread that is represented by the 'worlds' on this mailing list. On the other hand, it is far too easy to dilute the value of high speed nets by trying to exchange too much information, by including everyone in everything, by neglecting to address coordination and centralization/decentralization issues, or by trying to do too much.

Such a focus would not rule out efforts to rebuild or reshuffle the focus and membership of GIS-related organizations. But it seems to me that few individual universities have GIS-related efforts that really span the range of organizations currently involved in GIS. Hence, it would be hard for a UCGIA to be effective at this task until it had more experience in building and utilizing meaningful interdisciplinary connections across universities.

**Bob McMaster wrote:**

Since The University of Minnesota has at least 4 units, or departments, actively engaged in teaching and research in GIS, I have constantly tried to determine what binds this group together. I don't, by the way, include the activities of the Natural Resources Research Center, since Carol Johnston, also a member of the UCGIA Steering Committee, will provide that information.

I provide the following discussion, not so much to detail the specifics of the GIS program at Minnesota, but to illustrate the range of activities here, which I feel may be a microcosm of that outside the U of M. The Department of Geography teaches four courses in GIS, including the normal and advanced courses as well as a course in Urban Geographic Information Systems and Analysis. This is taught with the Center for Urban and Regional Affairs and offered through the Hubert H. Humphrey Institute for Public Affairs. Most of the class is filled with planning graduate students from the Humphrey Institute. The Forestry Department teaches an array of courses in remote sensing and one course in GIS-- GIS for Natural Resources. The Forestry Department--at least those teaching in remote sensing and GIS--has a close relationship with Minnesota's Department of Natural Resources. Many of the projects at Forestry are sponsored by the DNR. Also in the College of Natural Resources, in the Fisheries and Wildlife Department, is a GIS course that teaches the fundamentals of ARC/INFO for natural resources. Lastly, the College of Architecture and Landscape Architecture, with Geography, teaches an Introductory GIS class. I would not be surprised if some other unit was teaching an aspect of GIS that I was not aware of. I know, for instance, the School of Public Health here is quite interested in computer mapping and spatial analysis, although they probably have not "progressed" into GIS. My point is that GIS is all over the place here with no real common thread or institutional structure to bind it together. I am certain others have faced the same situation and, in general, the field of GIS faces this as a whole. I see this as a problem with the establishment of a UCGIA (which I do strongly support): getting a handle on who is actively engaged in GIS, what they are doing (both applied and basic), and where they are. I also feel this is related to the issue of professional societies. It is perhaps through some type of formalized structure amongst the different professional societies with an interest in GIS that it will be possible to coordinate efforts. By in some way binding together UCGIA and this "structure"--I need a better word here--coordination could be possible. I had no idea, for instance, that The Society of Wetland Scientists (as explained by Carol Johnston) was active in GIS. There are undoubtedly many other examples. But there appears to be a logical place to start--the GIS/LIS Consortium. ACSM has the ACA (American Cartographic Association) and most probably soon another Member Organization on GIS; ASPRS has the Geographic Information Systems Division. AAG has the Geographic Information Systems Specialty Group (along with several others with an interest in GIS, including the Cartography Specialty Group, Quantitative Methods and Mathematical Models Specialty Group and Remote Sensing Specialty Group). Both URISA and AM/FM International have a strong interest in GIS, although I don't know if they have divisions (in terms of subspecialties) within their organizations. Perhaps what is needed, initially, is an inventory of organizations involved in GIS, with the idea that GIS/LIS is "at the core". Based on this inventory, attempt to determine the relationships and bonds amongst the GIS community. Why? From my perspective, a critical task of UCGIA would be to establish some type of comprehensive research agenda. It would be difficult to produce such an agenda without detailed knowledge of the range of activities in GIS. And the best source is probably a survey of existing efforts, based on the activities of professional societies. Thus the Society of Wetland Scientists, for example, could provide the GIS/LIS core with a representative, along with the many other societies. This would enable UCGIA, with a linkage to the GIS/LIS core, to have the best knowledge in creating the agenda.

**Ron Abler wrote:**

This is a belated elaboration of my earlier message about a multidisciplinary organization for individuals with GIS research and teaching interests. I've shared the notion with a limited number of people since February, and as noted earlier, gotten mixed reactions.

GAIA International (Geographical Analysis and Information Association) would be a global, multidisciplinary, scholarly organization that focuses on the theory, methods, and applications of GIS in anthropology, cartography, computer science, electrical engineering, geodesy/surveying engineering, geography, political science, remote sensing, and visualization, and other specialties. As I see it, the organization's major purposes would be to advance the interests of the GIS specialties through publication (networked digital and traditional) and by holding scholarly conferences. I would get it rolling with an organizing committee of 10 to 12 individuals who can represent the diversity of specialties with a stake in GIS/GPS. It would

do for GIS on a global scale what the AAG does for geography on a (primarily) national scale. It would have the normal complement of officers, [and some] sort of governing board or council.

**Marc Armstrong** wrote the following piece entitled "On the Role of UCGIA in Maintaining and Furthering GIS Education", after the panel discussions at GIS/LIS'92:

I begin with the premise that UCGIA will be an organization with a distinctly educational mission. As the specific nature of this mission evolves, as it inevitably will, it must be reinforced and supplanted by the latest GIS research and development activities. Thus, the UCGIA must ensure that strong linkages are maintained between academic researchers, educators and GIS professionals who are engaged in application development. The educational mission of UCGIA should have two primary foci: faculty development and GIS application development and outreach.

**Faculty Development.** During the coming decade, the projected effects of the decline in numbers of Ph.D.'s who are qualified to teach and do research in institutions of higher education will begin to become evident in academia. The impact on U.S. post-secondary education will be felt in many ways, but it will be felt especially in fields such as GIS, that are even now experiencing a kind of 'brain drain' as researchers are drawn into good jobs in government and the private sector. One way to reduce the impact of this trend is to ensure that faculty, many of whom may have extensive graduate training in allied fields such as spatial analysis, photogrammetry and remote sensing and cartography, can take part in continuing education and development programs. To address this problem, UCGIA might hold specialized intensive training programs for faculty members, many of whom may be on sabbatical leaves. UCGIA might also provide training for advanced graduate students who may, ultimately, wish to teach GIS and use GIS in their research, but who may have insufficient educational resources at their home university. In this way, UCGIA can serve to broaden the reach of GIS and help to foster a consistent level of high quality instruction in basic GIS principles.

**Application Development and Outreach.** As GIS begins to make inroads into a wide variety of new areas of application, each discipline will, to a certain extent, independently discover what may already be well known in other fields. UCGIA can actively work to ramp up the process through which application areas across different disciplines embrace GIS and shorten the time in which these areas can begin to make progress in applying GIS to research questions. A series of educational initiatives would bring together leading researchers in a particular field with GIS experts in related fields. To an extent, this parallels the activities of NCGIA who has sponsored several conferences along similar lines. UCGIA must, however, establish a means through which promising areas of GIS applications can be identified and through which educational initiatives would be developed. Once knowledge is 'routinized' and disseminated through the various professional societies and journals that are focused on an application area, the development phase will conclude and the ordinary machinations of knowledge creation will take place. UCGIA could also engage in ongoing training programs to support professional development in allied areas.

Consider, for example, demography. Demographers routinely use methods and materials that have a distinctly spatial character to them. Yet, in many ways, GIS technology remains foreign to most demographers who have a traditional academic pedigree. With the widespread availability of GIS software, spatial databases such as TIGER, and small area statistics, the field could undergo a technological transition of sorts. UCGIA could serve as a focusing mechanism to support such transitions.

### **Report on a Panel Discussion at GIS/LIS'92**

At GIS/LIS'92 in San Jose, California in November 1992, the UCGIA Steering Committee met to discuss the issues surrounding the idea. Later in the meeting, a public panel discussion was held to examine many aspects of the UCGIA concept. The panelists, in alphabetical order, were: John D. Bossler, David Cowen, Joseph Ferreira, Jr., Michael F. Goodchild, Leonard Hochberg, Robert B. McMaster, and Waldo Tobler. The panelists and panel chair were all members of the UCGIA Steering Committee, except for Tobler (Department of Geography, University of California, Santa Barbara).

David Cowen chaired the session. Michael Goodchild reviewed the origins of the UCGIA concept, and noted that the multidisciplinary nature of GIS is both a strength and a weakness. The weakness is that such fields are at risk to 'fall between the cracks' in both funding bodies and educational institutions, where decision-making is often organized around traditional disciplines that have become reified as departments or programs. At present, no organization represents either the basic research community or the education community. Industry leaders, but also representatives of national and local governments, have expressed interest in a national research agenda that would indicate priorities for basic and applied research. Educators also could benefit from coordination at the national or international levels.

John Bossler began his remarks by noting that an organization such as that described under the UCGIA label would probably be useful, since it could potentially provide one voice, one name, and one focus for the GIS community. However, with its present and vague definition, its establishment may not be a high priority. To know whether a UCGIA would be worth forming, there needs to be a clear idea of what it would do. Many of the functions mentioned for UCGIA are already being done by existing organizations. Establishment of a national research agenda for the field may be a good thing, and such agendas have helped other disciplines, but it could produce negative impacts if research, especially funding, were controlled through UCGIA, or even if there was an appearance of such control. How much effort would be needed to achieve the altruistic cooperation of the organizations and disciplines currently involved in GIS/GIA?

Joe Ferreira echoed Bossler's comments that determining what one is trying to accomplish is an important early step in discussing UCGIA. Such an organization could function as a sort of 'union' to bargain collectively with industry or government. It could be a vehicle for critical mass on major research or educational initiatives. It could provide access to technology, data, and ideas. And it could provide a peer group. Ferreira concluded by proposing that high speed access to data and technology could provide the unifying theme that could make such an organization worthwhile.

Len Hochberg provided a very interesting review of what it is like to try to establish a GIS lab and research program in the social sciences at a major university that has neither a geography nor a surveying engineering department. Hochberg was rather pessimistic about the prospects for interdisciplinary GIS user groups at institutions without the academic departments that normally provide central institutional foci for GIS at campuses that have them. Perhaps a UCGIA could help, but perhaps not.

Bob McMaster described the rather different situation at the University of Minnesota. There, GIS is used in an even more diverse range of departments than at Stanford, but at Minnesota a strong geography department does seem to provide an institutional focus. McMaster focused on the 'national research agenda' topic that was the stated topic of the panel, and noted four possible models. One is to ask the NCGIA to do this; however, this could provide a conflict with NCGIA's own institutional interests. McMaster suggested that revisiting some of the alternative NCGIA proposals submitted to NSF in 1988 could still provide useful insights into major elements of the GIS/GIA research agenda. Another way would be a consortium of existing societies; this could however disadvantage those members of the GIS community from outside the GIS/LIS core disciplines. A third possibility would be a new member society; that however would be a potential drain on existing societies. And lastly there is the UCGIA idea, a coalition or council or consortium of institutions involved in GIS research and/or teaching. Advantages center around the pooling of research and teaching resources, and perhaps better access to funding, but disadvantages include initial costs (financial and personnel) and the risk of a "restrictive" research agenda.

Waldo Tobler provided a few anecdotal comments to complete the panelists' presentations. One model for UCGIA has been UCAR, the University Corporation for Atmospheric Research, that among other things manages NCAR (National Center for Atmospheric Research). UCAR however is a high-budget organization related mainly to a unique research facility in a focused field. Tobler also described an effort among 5,000 radio astronomers in the United States to establish a national research agenda; that effort led to some \$25 million in funding from public and private foundations. However, the great diversity of GIS and spatial analysis makes such scenarios unlikely for our field. Access to emerging information technologies might provide a good reason for organization to join at UCGIA and to participate in it actively.

The panelists' statements were followed by about 40 minutes of open discussion involving the audience. Harlan Onsrud (Department of Surveying Engineering, University of Maine) briefly described some other consortia that might provide models for the organizational structure of a UCGIA. Nick Chrisman (Department of Geography, University of Washington) described campus-wide GIS-related activities at his former institution, the University of Wisconsin, Madison, and noted that a dual focus on technology and on outcomes is important. At the University of Washington, building critical mass in GIS/GIA is difficult because GIS-related interests are spread across many faculties and deanships. The new national focus on infrastructure and information means that the idea of a UCGIA is timely. Bruce Fogarty of IBM pointed out that UCAR provides a focus that makes it easy for government agencies and industry to support research in the atmospheric sciences with some accountability. Joel Morrison (US Geological Survey) provided a cautionary voice, noting that there were too many issues on the table at the panel, that the ideas would need to be focused. John Bossler described the UNAVCO consortium for GPS research, noting that it capitalizes on NSF encouragement to share scientific instruments and other equipment; UNAVCO is run by UCAR.

Bob Aangeenbrug (Department of Geography, University of South Florida) raised an apprehension that this UCGIA was being created for some unspecified person or special interest group. The GIS community would be ill-served at this time if a 'monument' were created. Lynda Wayne (Louisiana State University) noted that the former governor of Vermont, who was involved in the establishment of GIS in that state, is a member of the Clinton/Gore transition team; this might provide a window for further prominence of GIS in the national agenda. In summary, although reservations were reservations, there was also enthusiasm. A consensus seemed to exist that cautious further exploration of the UCGIA concept should proceed.

## The Name

At the time of this writing (November 1992), many aspects of the name of the 'UCGIA' were open for discussion, depending on the nature and mission that evolves for the organization.

- U** University. This word might be dropped if 'UCGIA' takes on a primary focus in basic research and may include government laboratories and private laboratories as members
- C** This letter could stand for 'Consortium' or 'Corporation' or 'Council'
- G** Geographic
- I** Information and
- A** Analysis. This might be replaced by an 'S' for 'Science' or 'Sciences' or perhaps even 'Systems'.

## UCGIA-L: An Electronic Discussion List

An electronic mail distribution system has been established to discuss the UCGIA concept. This list is called UCGIA-L, and is available to anyone with electronic mail access to either BITNET or Internet. To subscribe, send a I -line email message to:

listserv@ubvm.cc.buffalo.edu	(Internet)
listserv@ubvm	(BITNET)

The body of the message should be:

subscribe ucgia-l 'Your name'

where 'Your name' is your personal name (without quotes).

## Summary

The UCGIA concept has met with general support from the GIS community, but some cautionary notes have been raised. Discussions will continue by electronic mail and other media. The presentation of this paper in New Orleans will include an update on the UCGIA concept, based on recent developments.

## APPENDIX:

### **Members, UCGIA Steering Committee, November 1992, in alphabetical order:**

Ronald Abler, Association of American Geographers  
Marc Armstrong, Department of Geography, University of Iowa  
John D. Bossler, Center for Mapping and Department of Geodetic Sciences, The Ohio State University  
David Cowen, Department of Geography, University of South Carolina  
Joseph Ferreira, Jr., Department of Urban Planning, Massachusetts Institute of Technology  
W. Randolph Franklin, Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute  
Michael F. Goodchild, Department of Geography, University of California, Santa Barbara  
Kingsley Haynes, Public Policy, George Mason University  
Leonard Hochberg, Department of Sociology, Stanford University  
Carol Johnston, Department of Biology, University of Minnesota, Duluth  
David M. Mark, Department of Geography, State University of New York at Buffalo  
Robert B. McMaster, Department of Geography, University of Minnesota  
Judy Olson, Department of Geography, Michigan State University  
Harlan J. Onsrud, Department of Surveying Engineering, University of Maine  
Alan Vonderohe, Department of Civil and Environmental Engineering,, University of Wisconsin, Madison  
Jeff Wright, Department of Civil Engineering, Purdue University)