

## UCGIS GIScience Education Challenges

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The University Consortium in Geographic Information Science (UCGIS) is comprised of more than 50 universities, research laboratories, and professional societies. The consortium was formed to serve as an effective, unified voice for the GIScience research community. In a survey conducted in October 1998, UCGIS members again strongly asserted the importance of (1) expanding and strengthening GIScience education at all levels and (2) fostering multidisciplinary research and education in GIScience.

Recognizing the interdependence of research and education and the prominent role that research institutions must play in the community of GIS educators, UCGIS devoted the Second Annual Assembly, held in June 1997 in Bar Harbor, Maine, to the identification of a set of critical priority areas for action by GIScience educators and others. The following summer at the Third Annual Assembly held in Park City, Utah, a special one-half day roundtable session focused on discussion of these and other related education issues. This statement summarizes the outcome of these activities.

At the Bar Harbor Assembly, 45 GIS researchers and educators from 30 UCGIS member institutions participated in several education priorities working groups. These discussions were the culmination of a year-long process that began with the formulation of an initial list of priority topics based on input from UCGIS member institutions and the participants of the Second International Symposium on GIS in Higher Education held in Columbia, Maryland in September 1996. These topics were refined during the year and several white papers were prepared for discussion at Bar Harbor. Recognizing that UCGIS member institutions are only a small part of the total GIS education community, considerable discussion was focused on how to best use the memberships' particular strengths and roles to further GIS education. As a result an additional topic, Research-Based Graduate Education, was added to recognize the critical and unique role played by the research institutions. As well, care was taken when considering areas in which UCGIS members are only minor players (such as K-12 education and technical GISystems training) by putting emphasis on how UCGIS can best contribute to advances in these areas.

At the conclusion of the meeting, eight GIScience education challenges were endorsed by the UCGIS Council. Revised white papers are posted at <http://www.ucgis.org>. Briefly, these challenges address the following priorities:

- **Emerging Technologies for Delivering GIScience Education**

Emerging technologies hold great potential for improving the quality and expanding the scope of GIScience education. UCGIS, by virtue of its focus on research in both theoretical and applied GIS and related technologies, is already at the forefront of many of the advances in these new communication and graphic media, and is well placed to play a major role in testing and advancing new educational technologies.

- **Supporting Infrastructure**

The establishment of appropriate infrastructure is a necessary consideration in GIS instruction. Planning for GIS education involves the determination of hardware, software, data and personnel needs. Ongoing issues of maintenance, upgrade and administration support for faculty efforts must be also addressed.

- **Access and Equity**

As GIS becomes a more ubiquitous tool in society, it is incumbent upon the education community to ensure access and equity with respect to this technology. Thus, in our classrooms we must strive to address the needs of disadvantaged groups and impaired individuals and to explore whether and how the costs and benefits of using GIS are distributed throughout society.

- **Alternative Designs for Curriculum Content and Evaluation**

Improving GIScience education requires the development of curricula for a wide range of student constituencies. For each constituency, we need to identify relevant key concepts; determine the most effective educational delivery modes; and develop appropriate monitoring and assessment techniques.

- **Professional GIS Education**

Given the rapid transformations in information technology, working professionals now need on-going education in order to keep up with changes in both the techniques of their professional fields and digital technology. Given the cross-disciplinary nature of GIScience, this group is perhaps the largest and fastest growing student constituency for GIS and thus needs particular attention.

- **Research-Based GIScience Graduate Education**

To advance the state of GIScience, universities must educate researchers and research-capable educators. For this very specialized constituency, it is important to identify the areas of advanced study required and to develop education opportunities in these areas. The previously identified UCGIS research priorities provide some context for the work.

- **Learning with GIS**

Instruction in problem solving using geographic information is becoming more prominent at all education levels as spatial literacy and computer skills continue to be emphasized as national goals. Learning with GIS proposes a curriculum supported by various digital toolkits which utilizes geographic information and spatial analysis to study a wide range of topics. The focus is upon using GIS for learning, rather than learning about GIS.

- **Accreditation and Certification**

There is a clear need for a general framework for GIS education which can guide educators, employers and students. In order to ensure there is an adequate pool of well-qualified GIS practitioners who can meet current and future needs, UCGIS acknowledges that we must be active partners in discussions addressing these areas of educational policy.

At the 1998 Park City Assembly, 30 delegates from universities, government agencies, and the private sector devoted one-half day to a discussion of several issues relevant to the eight GIS educational challenges previously adopted by UCGIS. Two of these issues are of particular relevance to this Education Summit:

- **New education and training demands from the workplace**

Discussants noted the important role that computer science should have within university GIScience education programs and the need to overcome barriers between departments of computer science and departments that offer courses in GIS. As a result of this discussion, UCGIS is sponsoring the development of a model, multi-path curriculum for GIScience. This initiative is now underway under the leadership of Dr. Duane Marble.

## UCGIS Statement

- **Certification efforts within the GIS community**

After substantial discussion over the pros and cons of certification and certification programs, it was decided that, while UCGIS is unlikely to initiate any certification or accreditation programs itself, UCGIS members need to be informed of all efforts to certify GIS professionals since these will impact what we need to teach. An ad hoc committee, headed by Drs. Karen Kemp and Lyna Wiggins, agreed to respond actively to information about certification and accreditation efforts worldwide and to make recommendations to the UCGIS membership about the role the organization should play in this matter.

For more information about UCGIS GIS education challenges and activities please visit our website at URL: <http://www.ucgis.org>.

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