

# University Consortium for Geographic Information Science Strategic Plan

## Background and Context

The UCGIS consortium was formally organized in 1994 and incorporated as a nonprofit organization in 1995. The organizational mission and the bylaws crafted in 1994-1995 were a result of discussion and debate among active scholars in the field who represented the gamut of academic disciplines that were engaged in developing and/or innovating with geographic technologies. The decisions about the scope, purpose, and the role for UCGIS were also informed and shaped by the experiences of the National Center for Geographic Information and Analysis (NCGIA)<sup>1</sup>.

The overarching need for a consortium such as UCGIS to exist has always been that the consortium could take on projects and activities considered too large or too complex for a single researcher/research group or even a single academic institution to tackle alone. Even a cursory reading of the UCGIS mission statement<sup>2</sup> will confirm that when the consortium was formed, its proponents believed that the consortium could and should serve as an umbrella organization to unify the geographic information science and technology (GIS & T) field. Examples of such activities successfully undertaken by the UCGIS consortium include identifying research priorities for the field and the development of a model curriculum for undergraduate GIS & T education.

During the strategic planning retreat undertaken by the board in 2011<sup>3</sup>, participants converged around three themes that made UCGIS “special”. First, the quality and meaning ascribed to its products<sup>4, 5</sup>; second, its stellar reputation that could be leveraged to create transformative or broader impacts<sup>6</sup>; and, third, the sense of community that came from being actively involved in the organization<sup>7</sup>. These themes are consistent with the organization’s mission to serve as an advocate and voice for the GIScience research community. In marketing terms, these three themes also help to define the UCGIS brand. The mandate for UCGIS in the research and education arenas seems relatively uncontested and clear and it has not changed dramatically since the early years when the consortium was established. These mandates are further reinforced by the consortium’s mission and bylaws<sup>8</sup>.

## The Need for a Strategic Plan

The mission and structure of UCGIS often pulls the leadership in multiple directions, requiring its board and officers to function in a reactive, rather than proactive mode. The day-to-day business of UCGIS often proceeds slowly because of the need to build consensus. Yet, the fact that UCGIS continues to survive and thrive with a loyal institutional membership base in this era of shrinking university and federal budgets should be considered a testament to its success and the dedicated work of previous Board presidents, Board members, and the countless volunteers.

However, the institutional membership structure that is the hallmark of UCGIS defines and limits the revenue that can be raised in any given year. UCGIS has a roster of 70 universities (Attachment 1) and with every passing year, this number grows slowly. UCGIS, based on statements provided by the Executive Director and the Treasurer, show UCGIS balancing its

budget and maintaining a modest surplus since 2008<sup>9</sup>. Our Executive Director has repeatedly noted that “[the UCGIS] cash balance [can be] increased by the collection of receivables and that has been an issue for years”. This pragmatic concern about delinquent dues has consumed the energy and attention of several UCGIS Presidents and board members in the past. In recent years, the UCGIS board has made several strategic decisions, for example increasing member dues that had not been raised since the organization was founded, and creating two year leadership terms to facilitate implementation of ideas and preserve institutional memory.

However, any nonprofit organization, especially one that is approaching two decades of its existence, needs to engage in a critical reflection about its mission, objectives, day-to-day operations, and its relationship to its membership and external partners.

### **Strategic Planning Activities (2011 - 2012)**

The UCGIS Board and Officers that convened in February 2011 (Attachment 2) immediately following the 2011 Winter Assembly were invited to participate in a retreat jointly organized by May Yuan, University of Oklahoma/UCGIS President (2011-2012), Tim Nyerges, University of Washington/UCGIS Past President (2011-2012), and John Wilson, Director of the Spatial Sciences Institute at the University of Southern California. The retreat was organized with a broad vision to consider “the future of the spatial sciences” (Attachment 3). It was held at the USC Wrigley Marine Science Center on Catalina Island in April 2011. The invitees consisted of the past and present leadership of the University Consortium for Geographic Science (Attachment 4). The participants, given their strong ties to UCGIS, discussed the future of the field and also focused on the ways in which UCGIS could be reorganized to better serve its members and the nation as a whole. Many Catalina retreat participants questioned the current UCGIS membership model: Who should/could UCGIS serve? Was the institutional membership model best suited to serve the academy at the present time? These questions became part of the board’s strategic analysis.

The work of the UCGIS board members and officers in 2011-2012<sup>10</sup> has been shaped by their commitment to:

- follow established formal procedures and govern in accordance with the articles of incorporation of UCGIS and its bylaws;
- be diligent stewards of the UCGIS organization and to act in a responsible and prudent manner while conducting UCGIS business; and to,
- act responsibly to protect the interests of the UCGIS organization by avoiding actions or behaviors that may be in conflict with the mission, bylaws, or the strategic interests of the organization and its membership

Board members and officers met in Boulder and spent two days, immediately before and after the Summer Assembly, to further discuss strategic issues (Attachment 5). The deliberations addressed several themes including:

- What is so special about UCGIS? Why do we need a UCGIS?
- What are the opportunities and challenges for UCGIS in the future?
- What is the UCGIS value proposition? Who are we serving? Should we revisit the institutional membership model? If so, how?

- Should the UCGIS mission be changed? If so, how?

Members convened again in New York during the Annual Meeting of the AAG (Attachment 6) and continued to refine the organizational mission statement and discussed strategic objectives for 2012 – 2014. The activities during 2011 – 2012 collectively provided opportunities for different points of view to be heard, discussed, and debated. Some clear strategic directions and operational tasks were identified. The Board has taken actions to address short/medium-term operational issues while simultaneously considering the long term goals/future of the field and the organization.

## **Strategic Analysis and Synthesis**

### **Membership**

UCGIS was created by academics to serve the academy and the emerging field of GIScience. UCGIS's core membership base is academic institutions (4 year colleges and universities) that have a strong GIScience presence through the presence of faculty, teaching programs and research activities. There has always been some ambiguity about which universities should belong to UCGIS. UCGIS members initially represented research universities<sup>11</sup>.

In 2012, GIS activities are now found across a wide range of university campuses. Furthermore, GIS research now occurs outside traditional academic departments in free-standing research centers<sup>12,13</sup>. GIS education and workforce development needs are predicted to grow rapidly, at least in some fields like geo-spatial intelligence<sup>14</sup>. Universities and other education providers are racing to provide instructional programs, certifications, and other credentialing schema to meet these anticipated demands. Workforce development, and by extension, education and training have become important to UCGIS member institutions.

The current institutional membership structure (two voting delegates representing each university) is insufficient to represent the range of GIS activities happening on a single university campus. In some instances, the major GIS player on a campus may not be affiliated or only loosely affiliated with an academic department. By allowing for a formula to increase the number of delegates from different universities, UCGIS will be acknowledging and directly engaging active researchers and educators on established university campuses. The 2003 Strategic Plan spoke directly to this concern and indicated that “there is a need (within the current membership) to address policies for multiple categories of membership, services, privileges and dues structures”<sup>15</sup>. Greg Elmes in his 2005 guest editorial assessing the performance of UCGIS at the ten-year mark also noted that, “as it sets out on the second decade, perhaps now is the time for a re-invigorated vision, more diverse membership, and deeper roots”<sup>16</sup>.

UCGIS must necessarily engage with those universities with strong GIS education activities and programs. In terms of increasing and expanding the UCGIS membership base, UCGIS should strive hard to reach out to colleges and universities with rigorous GIS research and teaching programs.

For those universities that are just beginning to make investments in GIScience research and education, UCGIS should modify membership guidelines/requirements to enable a single GIS program/ academic degree granting unit/ GIS research center to become a member of UCGIS thereby paving the way for that unit to become recognized on that campus as the GIS champion. The history of GIS adoption and use in government and industry clearly articulates the powerful role that the role of “champions”<sup>17</sup> and “white knights”<sup>18</sup> play in demonstrating the “value proposition” about the importance of GIS throughout the organization. This tested strategy can be used to strengthen GIS at individual university campuses.

***Emphasizing inter-disciplinary diversity that is the hallmark of GIScience, UCGIS should engage researchers, scientists, educators, and students who are formally affiliated with a four-year college or university, regardless of where that GIS research, education, and community-oriented activities occurs at that university. UCGIS should revisit the institutional membership model to allow for multiple categories of membership and develop a fee structure with associated rights and privileges that allows for different levels of participation and engagement.***

### **Meeting Formats**

When UCGIS was founded, the organizers planned for two meetings, a summer assembly and a winter meeting. The meetings were also an opportunity for the delegates to transact association business in meetings of the Council of Delegates. The summer assembly usually had the hallmarks of a Chautauqua assembly, where the focus was on deliberation, debate, and eventually consensus about important issues. There are many members within the academy who cherish this type of meeting format. For these scholars and researchers, the focus is on big ideas and complex questions rather than a conventional conference where papers are presented with limited opportunities for interaction. On the other hand, a fair number of mid-career and junior scholars are eager to participate in a more traditional conference format where they will have opportunities to present work-in-progress and receive critical but supportive feedback from peers and senior scholars. In 2012, there is also a demand for publication opportunities (conference proceedings) to keep up with academic productivity demands (Attachment 7).

The strategic planning group that met in Boulder did not want to abandon the essence of the assembly concept. However, the UCGIS board, as part of its deliberations voted to combine components from the traditional winter meetings and summer assembly into a newly invigorated UCGIS annual symposium that could accommodate tracks on policy, research, and education. The 2012 symposium was the first meeting that was presented in this new format. It was successful in terms of participation rates and the organizers have received positive feedback from attendees. However, the 2012 symposium has a long way to go before it can claim to serve as the comprehensive GIScience conference for multiple disciplines driven by the academic community. Both Catalina retreat participants and Boulder strategic planning participants expressed the desire for UCGIS to create/support a comprehensive GIScience conference in order help build UCGIS national leadership as well as greater benefits to our membership.

UCGIS has also had some limited success in sponsoring and co-sponsoring specialist meetings<sup>19</sup> on topical issues. The 2011-2012 strategic planning process identified the need

for fostering graduate students and providing specialized training for graduate students through intensive workshops. Furthermore, the Catalina retreat participants discussed and agreed upon the need for a US-based summer research institute modeled after the Vespucci Initiative<sup>20</sup> to advance geographic information science, a project supported by government and industry.

***UCGIS should establish a hybrid format of an expanded annual meeting that includes program elements that satisfy/benefit different sub-groups. UCGIS should explore the opportunities to host a summer institute or workshop immediately preceding or after the UCGIS annual meeting dedicated to fostering PhD students (e.g., dissertation workshops; specialized training, and/or career development)***

### **Clarifying the Role of the Policy and Legislation Committee**

The mission of the P&L committee, one of the three standing committees of UCGIS, has been to monitor, analyze, and draft UCGIS responses<sup>21</sup> to legislation and policies of interest to the GIScience community. The committee's main focus has been primarily on federal activities. In practical terms, however, the P&L committee has focused its energies around organizing the annual winter meeting in Washington DC.

The purpose of the Winter Meetings in Washington DC meetings was to inform and educate policymakers about the power and potential of the emerging field of GIScience with the goal of eventually increasing federal investments in geospatial research and education.

When the Board decided to merge the two meetings into one annual meeting, the P&L committee was justifiably concerned that the policy focus would be reduced. In fact, the chair of the P&L committee, David Tulloch wrote, "Meeting in Washington D.C. with agencies and elected officials, both to learn about their latest programs and to show our potential as a community, was a central reason for forming UCGIS and remains one of the truly unique things that we accomplish. It does seem likely that over time that P&L is more at risk of getting minimized than other areas of UCGIS interest, [particularly if we move away from Washington meetings altogether]"<sup>22</sup>.

Yet, the record of the policy and legislation (P&L) in shaping federal funding policies has been mixed. In particular, there is no clear evidence to demonstrate that UCGIS activism vis-à-vis federal policy makers has had a significant influence in shaping federal funding priorities for GIScience and allied spatially oriented fields. Greg Elmes<sup>23</sup> succinctly summarized the situation in 2005 when he wrote:

In spite of the persistent, extensive and committed efforts of UCGIS members and corporate affiliates, particularly ESRI, GE Smallworld and Intergraph Corporation, and despite multifaceted evidence of the need for greater geospatial intelligence in the form of a globalizing economy, global climate change, extensive disasters such as the Indian Ocean tsunami, and the issues of national security, GI Science remains comparatively small, relatively unrecognized, and decidedly under-funded.

This is not to say that all government funding for GIS and related research has dried up. Funding for geo-spatial intelligence activities has increased dramatically in the post 9-11 era. However in the last five years, between 2007 and 2012, UCGIS has not been able to leverage geo-intelligence related funding to directly benefit its member organizations<sup>24</sup>. These circumstances are unlikely to change as the nation copes with changes in federal budgeting procedures and anticipated cutbacks at all levels of government.

With the creation of the [Council of Geospatial Organizations \(COGO\)](#), an alliance of stakeholder groups that combine government, industry, educational institutions, member organizations, and nonprofits, the need to monitor federal policy and legislation becomes less significant for UCGIS. Much of the policy agenda previously articulated in the UCGIS mission and goals statement, specifically emphasizing the need to “assess the current and potential contributions of GIS to national scientific and public policy issues” and “foster Geographic Information Science and analysis in support of national needs” can be accomplished by active and serious engagement with COGO. The UCGIS Past President has traditionally served as the representative to this organization.

Another group that is engaged with the policy agenda at the state level is the [National States Geographic Information Council](#) (NSGIC), whose mission is to “promote statewide geospatial coordination activities in all states and to be an effective advocate for states in national geospatial policy and initiatives, thereby enabling the National Spatial Data Infrastructure (NSDI)”.

Most UCGIS member universities maintain Washington D.C. based offices that track research and education legislation and advocate on behalf of their universities’ interests. These universities require issue-based advocacy to be coordinated with the D.C office and to be in line with overall university priorities, thereby constraining UCGIS initiatives.

***Over the years, the UCGIS mandate to “connect with policymakers on the Hill” has become vague and unclear. Therefore, the UCGIS board should clarify and define the role of the P&L committee to accommodate the current policy landscape and take a strategic approach when considering the government affairs functions of UCGIS.***

### **Increasing Engagement**

Presently, UCGIS is an under-resourced operation relying on the efforts and goodwill of its volunteers. Almost all of the volunteers are university professors with traditional teaching/research obligations. A few individuals who represent academic administrative units, labs, and UCGIS strategic agency and industry partners also participate in UCGIS business activities. On average, there 20 to 30 active volunteers. There is an urgent need to expand this volunteer base.

Revising the membership model and providing new opportunities for graduate students and junior scholars to get involved in UCGIS activities through annual meeting activities will increase awareness about UCGIS at the member institutions. It is expected that awareness and exposure to UCGIS will eventually translate to engagement and volunteerism among the next generation of scholars. Many of the current board members and officers are active in UCGIS because they have benefited from the experience of being involved. In tracking the

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history of how individual came to be part of UCGIS, the story is most often the same, i.e., a senior faculty member invited the junior scholar to come to a UCGIS meeting or delegated a UCGIS-related task to them. These connections between senior and junior scholars are vital to the organization and these connections happen on individual university campuses. The current mid-career generation of academic faculty and scholars has not yet been prepared for this mentoring role.

***The UCGIS board should seriously consider expanding the current board's composition to include a non-voting doctoral student representative. Further, UCGIS should continue to maintain a healthy mix between senior, mid-career, and junior faculty in the UCGIS nominations process for elected positions.***

***UCGIS should revamp and restructure the Young Scholars Committee.***

***UCGIS should streamline the UCGIS student and junior faculty awards so as to better align with UCGIS strategic goals regarding engagement.***

## **Operational Challenges**

### **Dues Collection**

The UCGIS Treasurer and the Executive Director are working on a plan to manage the delinquent dues situation. The board must engage proactively with this issue and make some firm decisions about how to reduce the financial burden on the organization. Specifically, the board should make the difficult decision to any drop member institutions that are seriously in arrears and have made no efforts to return to good standing. Our accountants have also recommended that any unpaid dues over two years be treated as uncollected debt and be recorded as such. These decisions are necessary to get clarity about the organization's financial picture.

### **Website Content Management**

The new UCGIS website has been designed to be maintained by volunteers with minimal support from a webmaster. A plan for website content management has to be devised and commitments from volunteers to maintain pages must be secured. One option of having the lead delegate from a member institution working with a graduate student to maintain the webpages has been discussed in the June 2012 communications committee meeting. However, this plan has to be discussed and approved by the board.

### **Symposium 2013**

The planning for Symposium 2013 should proceed in a timely way with serious engagement from board members, committee chairs and volunteers.

### **Review/Streamline Existing UCGIS Programs and Initiatives**

The UCGIS board should conduct a thorough review of its current projects, commitments, initiatives, and routine administrative practices to ensure that all actions taken by the board, its committee chairs, and officers are aligned with the strategic plan. This should also include a review of staffing issues and resource commitments.

### Establishing Priorities

UCGIS has historically been focused on building consensus among its diverse membership base. This approach has slowed down decision-making and implementation of agreed-upon ideas. This strategic plan and the decisions and action steps arising from it should become the guiding document that helps UCGIS board and its committees establish clear priorities, annual goals, and achievable targets.

### **Moving Forward**

The 2003 UCGIS strategic plan (the last formal strategic planning document available) refers to the need for a strategic plan that is continually updated and also discusses the need for an active engagement from the Council of Delegates. The 2003 plan distinguished between strategic and operational planning, reminding us that the strategic plan should set the context for annual operational plans<sup>25</sup>.

To summarize, the new strategic plan for UCGIS:

- Revises the mission statement to better align with the needs of our members;
- Revises the Membership structure to allow for different classes of membership;
- Presents the UCGIS Strategic Objectives for 2012-2014

### Name Change

We are not changing the name of our organization. It will remain as:  
University Consortium for Geographic Information Science (UCGIS)

### Virtual Council Meeting, December 2012

According to our current By Laws, UCGIS is required to hold two Council Meetings every year. The Executive Committee and Officers have reviewed the bylaws and there is no barrier to holding a virtual council meeting (an electronic town hall). This council meeting is an opportunity to present and approve the new membership structure/model. The last section presents the revised UCGIS Mission Statement and Strategic Objectives for 2012 – 2014.

### **UCGIS Revised Mission Statement<sup>26</sup>**

The UCGIS mission is to:

- build scholarly communities and networks to foster multidisciplinary geographic information science research and education;
- advance research in the field of geographic information science;
- expand and strengthen geographic information science education;
- promote the ethical use of, and access to, geographic information and technologies

## **UCGIS Strategic Objectives for 2012-2014**

### **Research**

- Develop an on-line infrastructure to initiate a series of bottom-up conversations about key research topics
- Deliver ONE specialist meeting in 2013-2014 on a key research topic/agenda of interest and relevance to UCGIS community with a separate funding stream designated for this activity

### **Education**

- Launch BoK version 2.0 in a collaborative and participatory way, with full engagement of member institutions and linking its development with on-going certification and accreditation activities undertaken by our sister geospatial organizations
- Launch and sustain initiatives related to mentoring and curriculum development in order to provide tangible guidance and support to PhD students and early career faculty

### **Community Engagement**

- Design and deliver a UCGIS symposium in 2013 and 2014 that will solidify the UCGIS brand identity as the one-stop meeting place for GIS researchers and educators from different disciplines
- Expand and grow the membership base of UCGIS by developing a more flexible membership structure that allows for different classes of membership, while maintaining the unique institutional membership arrangement that is identified with the UCGIS brand

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## **LIST OF ATTACHMENTS**

Attachment 1

Current Roster of UCGIS Members in Good Standing

Attachment 2

List of Board, Officers, and Chairs, 2011-2012

Attachment 3

Invitation to the “Future of Spatial Sciences” Retreat, Catalina, April 22-24, 2011

Attachment 4

List of Participants in the Catalina Retreat

Attachment 5

List of Participants in Boulder Retreat

Attachment 6

List of Participants in New York meeting

Attachment 7

Preferred Meeting Format Chart from UCGIS Survey

## END NOTES

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- <sup>1</sup> As one the largest funded GIS research activities occurring at that time, NCGIA (1988-1998), a multi-institution, multi-disciplinary research consortium was dedicated to basic research and education in GIS and its related technologies. NCGIA had organized its activities as a series of initiatives, ranging from Initiative 1 (Accuracy of Spatial Databases/Michael Goodchild) to Initiative 21 (Formal Models of the Common-Sense geographic World/David Mark and Max Egenhofer). NCGIA initiatives often coalesced around specialist meetings or workshops that provided opportunities for scholars to present work-in-progress, debate ideas, and receive critical feedback from their peers. Each specialist meeting or workshop usually resulted in tangible work products.  
Source: <http://umaine.edu/ncgia/history/>, accessed July 31, 2012
- <sup>2</sup> The current UCGIS mission is:
  - to serve as an effective, unified voice for the geographic information science research community;
  - to foster multidisciplinary research and education; and
  - to promote the informed and responsible use of geographic information science and geographic analysis for the benefit of society
- <sup>3</sup> Boulder 2011 Strategic Planning Retreat, “Why are you proud of UCGIS?” responses
- <sup>4</sup> Mc.Master, R. and E. L. Utery (Eds.) 2004. A Research Agenda for Geographic Information Science. Boca Raton, FL: CRC Press
- <sup>5</sup> DiBiase, D, Demers, M, Johnson, A, Kemp, K, A. T. Luck, B. Plewe, & E. Wentz (Eds.) 2006. Geographic Information Science and Technology Body of Knowledge (Paperback) Washington DC: Association of American Geographers
- <sup>6</sup> *“Belonging to UCGIS was/[is] special because UCGIS was/[is] THE place where the intellectual power of GIS was/[is] being created, shaped and deployed within the context of higher education (colleges and universities)”*, comment from a Boulder 2011 strategic planning retreat participant responding to the question, “When/Why are you proud of UCGIS?”
- <sup>7</sup> *“I feel proud to be part of UCGIS when I see senior and junior scholars working together to further GIScience”* a post-it note quote from Boulder 2011 strategic planning exercise
- <sup>8</sup> Institutional Membership model; All universities have the same number of delegates regardless of university size, composition, and academic status; Three standing committees including Research, Education, and Policy & Legislation
- <sup>9</sup> Balance Sheet Overview June 17<sup>th</sup>, 2011. Confidential document circulated by Jack Sanders
- <sup>10</sup> Paraphrased from guidance provided by Jack Sanders in his Executive Directors’ report to the Board in June 2011
- <sup>11</sup> Akin to the [Association of American Universities](#) that represents 61 research universities.
- <sup>12</sup> **Insert examples of high profile non-departmental research centers here**
- <sup>13</sup> According to the Campus Engagement Survey conducted by Daniel Goldberg and Laxmi Ramasubramanian on behalf of UCGIS in 2011, the list of departments and campus units reporting adoption and use of GIS includes many new areas including humanities, criminology, and public health in addition to the conventional and expected users like geography, computer science, urban planning, and landscape architecture. Non-academic university units such as the Office of Research, the Office of Admissions, the Library,

- Alumni Services, Campus Planning, Fundraising and Development, and Facilities Management are also heavy users of GIS on campus.
- 14 Future U.S. Workforce for Geospatial Intelligence committee “will examine the need for geospatial intelligence expertise in the United States compared with the production of experts in the relevant disciplines and discuss possible ways to ensure adequate availability of the needed expertise” Excerpted from NAS Project Information page <http://www8.nationalacademies.org/cp/projectview.aspx?key=49347>, accessed July 31<sup>st</sup>, 2012
  - 15 UCGIS Strategic Plan Updated May 2003. Downloaded from: [http://www.ucgis.org/membersonly/Administration/mo\\_strategicplan.htm](http://www.ucgis.org/membersonly/Administration/mo_strategicplan.htm)
  - 16 Elmes, G. (2005). *The University Consortium for Geographic Information Science : Shaping the Future at Ten Years*, *Transactions in GIS*, 9 (3): 273-276
  - 17 Croswell, P (1991) *Obstacles to GIS Implementation and Guidelines to Increase the Opportunities for Success*, *URISA Journal* 3(1):43-56
  - 18 Craig, W (2005). *White Knights of Spatial Data Infrastructure: The Role and Motivation of Key Individuals*, *URISA Journal*, Vol. 16 (2): 5- 13
  - 19 UCGIS Research Workshop on Computation and Visualization for the Understanding of Dynamics in Geographic Domains. See program information at: [http://www.ucgis.org/dynamics\\_workshop/workshop\\_agenda.htm](http://www.ucgis.org/dynamics_workshop/workshop_agenda.htm)
  - 20 The Vespucci Initiative organizes both specialist meetings and summer institutes where funding for participants is provided through government or industry contributions ([www.vespucci.org](http://www.vespucci.org))
  - 21 For example, the P&L committee has collaborated with other geo-spatial organizations to support amicus curae briefs opposing practices that would intrude on personal privacies and civil liberties.
  - 22 Policy and Legislation Committee Chair’s Report to the UCGIS Board of Directors, June 2011
  - 23 Elmes, G. (2005). *The University Consortium for Geographic Information Science : Shaping the Future at Ten Years*, *Transactions in GIS*, 2005, 9 (3): 273-276
  - 24 The exception that proves this general observation is the modest funding that UCGIS recently received to hold a series of workshops from the U.S. Department of Homeland Security “Geospatial Extension Program: Placed-based Geospatial Foundations” a project co-directed by Tim Nyerges and Sean Ahearn, both UCGIS Past Presidents.
  - 25 UCGIS Strategic Plan Updated May 2003. Downloaded from: [http://www.ucgis.org/membersonly/Administration/mo\\_strategicplan.htm](http://www.ucgis.org/membersonly/Administration/mo_strategicplan.htm)
  - 26 Based on the work of sub-committee of Strategic Planning group and reviewed and further refined in strategic planning meeting in New York.