Managing GIS through the Ever-Changing Technology Landscape

GIS Managers are regularly faced with making decisions about the introduction of new technology. We face this with new versions of existing technology, with new applications, with implementing new data models or upgrading existing ones. Introductions of new data sets, or third-party application upgrades which impacted our GIS environment also require change management. The considerations we feel are important are outlined in the article below.

A Certainty: Geospatial technology will change constantly

The very nature of technology dictates that change and evolution are constant. Competition and demand for the best, or should we say “better”, drives the innovation, as well as the creativity of people involved in building the latest, greatest, no matter what it is – an application, a new coding language, a whole environment, or network technology – these impact our world of geospatial management, as the consumer makes the demand happen, which moves us into the mode of constantly managing through change. It is one of our primary responsibilities as managers of GIS.

Do we need this now? The big question...

Often you get phone calls or emails from consumers in your organization who use GIS or the information products created by it. It goes something like this: “Hi, I just got back from XYZ Conference. So-in-So Company had this really cool app that I think we need to get to do our work. Can you get that for us?” It then is in your court to begin the initial vetting to answer the questions – “Do we need this now? Do we need this at all?”

If the function or purpose was unique, we would look at how it would fit into our existing implementation – always there are the considerations of “playing well with others” – hardware, network, other applications and data – essentially our environment. If the technology introduced new functions that had work better than something else that your organization already has under license.

My first response to the inquirer, if they were in a staff or team lead role, was: “Have you discussed this with your manager?” This would place the request in the right stream. Most companies require management approval of new technology purchases or some sort of supply chain review before expenditures.

If the request was from a manager, the discussion leaned toward how this product would be evaluated against existing technology already under license.

If the technology introduced new functions that had
an overall impact on our environment or considerably upped our resource demands, the implications could have significant ongoing impact.

We would need to evaluate for several key criteria for bringing in new technology:

• What is the business demand?
• Is it new or unique? Does it replicate or replace existing?
• What are the improvements that this would deliver?
• How would it be supported?
• Would it require new hardware, database licenses, or other additions that represent additional cost?
• Would there be a training requirement for both administrators and users?
• Cost/benefit and risk/reward considerations
• Overall impact on business tool sets and data

What drives your view – the technology or the business of your organization?
Initially, we experienced that the “new gizmo” or “hype” of a product would drive demand for bringing it into our organization. As GIS is an integrating technology, the resulting change related to this could be considerable, and in past situations, lessons learned were that the “hype” might die down, and the new application or technology would sit unused because interest and attention waned or moved on, to something new and shiny.

Sometimes we found that the new product was only partially utilized – perhaps only 25% to 50% - which introduced risk in terms of sustainability and support burdens including training, maintenance, data management, and process updating, not to mention extra budgetary exposure. Effectively, this showed that the new technology product really did not meet the demands of the business as advertised.

We decided that proper evaluation of proposed new technology was essential. We developed a criteria checklist and scoring system. This enabled us to be proactive and objectively consider the change. This took the “emotion” out of the decision. Most of us understood that consumers are often driven by emotion when making purchases of new technology. This is no different than buying a dream car. We needed to eliminate the “love” and bring stakeholders to the table and help them make the decisions objectively.

How do you enable your team to manage change? Helping them become change agents.
When change comes, after a thorough evaluation that it is a good decision, there is the need to manage the change – from planning to implementation and beyond. Some-times people do not have the first clue about how to begin and consider the change, along with the mechanics of an implementation. Requiring the people on your team to go through the process is essential.

Helping your team to develop business analysis and critical thinking skills goes a long way towards enabling them to become great change managers. Asking questions such as:

• Who are the stakeholders?
• Whose work will be affected by the change?
• Which teams need to be involved in the implementation planning?
• Does this have budgetary impact on any other teams?
• What will be the timeframe?
• Will everyone be able to work this into their current work projects?
• How do we inform our consumers that the change is coming?
• What roles will people play in the change?
• Who will train us?
• Who will need training from us?
• How will we support our consumers through the change?

All of the pertinent questions need to be considered, in terms of answers and solution planning ahead of any technology implementation. GIS is particularly susceptible to disruption as often the entirety of the user community is not well understood.

Your customers and consumers of GIS information products need to be included in your change management.
As we said before, stakeholders are an important member group of your technology changes through time. It takes effort to maintain the stakeholder group roster, and further effort to maintain their engagement. Regular meetings with your “GIS stakeholder community” are recommended to keep good communication channels open, regardless of whether there is change coming, or change happening at the time.

If you have members of your team responsible for maintaining a “GIS community of practice”, even more important is making certain that they are well represented and aware of ongoing changes and your plans related to change.

What if you have resistance, how do you handle it?
Early identification of resistance to change is essential. Most of the time there are early warning signals that emerge through communication from your users and consumers of GIS, as well as what your teams hear in their daily interactions, both internally and externally.

Seeking to understand the reasons for resistance by having conversations with those who are concerned or
show emotion about changes is essential. If you ask for their opinion and input, people feel more a part of the change vs. being a victim of change.

**Building a sustainable plan for managing and adopting the newest technology.**

For new technology changes and implementation the key is prior proper planning. As one of my old managers told me – “7 P’s” are important. “Prior Proper Planning Prevents the Pitfalls of Poor Performance.” Plan it, test it, adjust and go forth – repeat as needed.

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**Author:**

Ellen West Nodwell, GISP – Vice-President, Geospatial Services – IntegraShare Solutioneering, Inc. is a URISA Member, a GITA Member, and contributor to the GIS Manager and GIS Education communities. She has coordinated or managed GIS functions for over 15 years.

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February 22-25, 2016 • Hyatt Regency Savannah - Savannah, Georgia

We're going back to the 'birthplace' of this conference to celebrate the milestone 20th anniversary! This annual conference and exhibition is cooperatively presented by URISA and the International Association of Assessing Officers. This conference is designed to foster collaboration and integration of data, technology and functionality.

Call for Presentations • Submissions due: September 21, 2015

The educational program is developed through a review of submissions received through the Call for Presentations. The 2016 Conference Committee welcomes the submission of individual papers, complete sessions, panels and lightning talks and has proposed a list of suggested program tracks and topics for consideration (note that all abstracts received will be reviewed and considered for the conference program regardless of the list below).

We welcome topics of interest for all levels of expertise, from beginner to expert. As always, International topics are encouraged. To celebrate the anniversary of the conference, we'd also like to include a few presentations that explore how a specific technology or topic has developed over the twenty years that this conference has been in existence, while also incorporating a look to the future.

GIS Technologies
- CAMA GIS 101
- Web services
- Showcase your mapping system
- Aerial imagery and remote data collection used for assessment
- Mobile technologies
- GIS-centric database uses in mass appraisal
- GIS and CAMA sketch data
- Past, present and future

Parcel / Cadastral Mapping:
- Parcel editing systems
- Topology and related parcel errors
- Legal descriptions
- Cadastral data limitations/disclaimers (legal issues)
- Conversion case studies
- Requirements for moving into the parcel fabric (successes, lessons learned, alternatives to…)
- Real-world applications of standards (Cadastral, GIS etc…)
- Metadata
- Authoritative land/property records data
- Past, present and future

Integrating GIS & CAMA Data
(object-level / sub-parcel data possibilities):
- Manufactured housing
- Agricultural soil subtypes
- Mixed use properties
- Special Districts
- Condominiums
- Building footprints
- Severed mineral rights
- Addressing
- Commercial & Residential (multi-tenant properties)
- Business personal property
- Natural gas—storage and transmission
- Oil and gas valuation
- Zoning considerations
- Water rights
- Past, present and future

Professional Development
- Management challenges
- Effective communication strategies
- Public relations
- Office administration
- Career paths
- Past, present and future

Using Assessor’s CAMA Data and GIS for Emergency Planning
- Damage assessment
- Hazard mitigation
- Generation of accurate building layers for 911 / Emergency Services
- Data sharing (before and after an emergency)
- Cost sharing initiatives for expensive, big data, such as imagery
- Workflow support
- Valuation support
- Emergency support
- Past, present and future

Valuation
- Residential, Agricultural, Commercial valuation models
- Modeling to identify over/under valued properties valued by appraisers
- Spatial multiple regression
- Valuation appeal hearings, how to build a better case
- Desktop review using results of remote sensing / batch analysis processes
- Physical inspection vs. desktop evaluation
- Past, present and future

Data Sharing & Tax Policy Issues
- Licensing agreements
- How technology can help you share, protect and use your data
- Cross-organization technology and data cooperation – MOUs
- Case studies and success stories
- Water rights
- Legislative barriers/solutions
- Public private partnerships
- Centralized or decentralized GIS?
- Who is using your data and for what?
- Investment properties
- Vacation rentals
- Past, present and future

Again, this list is not comprehensive. All abstracts will be reviewed and considered regardless of the suggested topics in this table.

Abstract submissions are due by September 21, 2015.

Conference Details • Proceed to the Online Abstract Submission Form • Residential Valuation Modeling Contest
URISA is pleased to announce the recipients of 2015 Exemplary Systems in Government (ESIG) Awards. Since 1980, URISA’s ESIG Awards have recognized extraordinary achievements in the use of geospatial information technology that have improved the delivery and quality of government services. The award competition is open to all public agencies at the federal, state/provincial, regional and local levels. Applications were submitted within Enterprise and Single Process System categories.

ENTERPRISE SYSTEM CATEGORY - Systems in this category are outstanding and working examples of using information systems technology in a multi-department environment as part of an integrated process. These systems exemplify effective use of technology yielding widespread improvements in the process(es) and/or service(s) involved and/or cost savings to the organization.

The 2015 Enterprise System Category Winner is “Boldly Know: York Region’s Enterprise GIS” submitted by John Howeling, Director, Geographic Information Services Branch, Corporate Services Department of the Regional Municipality of York, Ontario Canada.

Summary: The Regional Municipality of York’s enterprise GIS system delivers a platform bringing together elements of corporate and regional priorities to support citizens and staff access to information in a timely manner. This access not only supports corporate decision-making, it also supports public inquiries making the Region more engaged and connected with its community. The system itself is a complex orchestration of technologies which deliver multiple end point solutions consisting of data from 650 spatial and business data sources and integrates with critical asset and work management systems. The system was made possible due to the hard work of a passionate and committed team whose success was dependent on building and maintaining collaborative relationships with municipalities, local businesses and other agencies within the Region. Because the Regional Municipality of York Boldly Knows how to deliver GIS and government services in a manner that builds and engages the community, it is deserving of the 2015 Enterprise Exemplary Systems in Government Award!

Distinguished Systems recognized in the Enterprise System Category include:
- Transportation Information Mapping System (TIMS)

SINGLE PROCESS SYSTEM CATEGORY - Systems in this category are outstanding and working examples of applying information system technology to automate a specific SINGLE process or operation involving one department or sub-unit of an agency. The system application results in extended and/or improved government services that are more efficient and/or save money.

The 2015 Single System Category Winner is “Next Generation Permitting System”, submitted by Dennis Hamborg, Planning and Land Services Director, Pierce County, Tacoma, Washington.

Summary: In support of a growing economy dependent on the construction industry, Pierce County recognized the need to process building permits in a more efficient manner while upholding building standards to ensure public safety. Additional drivers for this initiative include the implementation of fiscal restraints and customer demands and expectations. The result is a project that revolutionized the permitting process in Pierce County whereby traditionally paper-based processes were replaced by online and mobile tools enabling ease of application, inquiry and inspection. The impact is a system which has reduced customer inquiries by 20% while also reducing the average customer consultation requirements by nearly 80%. Because of the corporate, community and economic impact of Pierce County’s efforts, its Next Generation Permitting System is deserving of the 2015 Single Process Exemplary Systems in Government Award.

Distinguished Systems recognized in the Single Process System Category include:
- Calgary Automated Survey Plan Verification and Reporting (CASPER)
- Mobile Voter Line Wait Application

Submitted by: Arne Svedahl, Leader, Cadastral GeoSpatial Asset Management, City of Calgary, Alberta Canada
- Nate Irwin, Web Mapping Coordinator, US National Park Service

continued on page 6
Awards continued from page 5

The accomplishments will be recognized during the Awards Ceremony at GIS-Pro & NWGIS 2015 in Spokane, Washington, October 18-22, 2015. The recognized systems in each category will be discussed in featured sessions during the conference. In addition, each system will be highlighted in an upcoming URISA webinar series.

To review the winning submissions for this year’s ESIG Awards, visit http://www.urisa.org/awards/exemplary-systems-in-government/. For details about GIS-Pro 2015, visit www.gis-pro.org.

The new GISCI Geospatial Core Technical Knowledge Exam® for the GISP Certification is coming!

The Exam date will be announced in the next few weeks and a signup procedure will be provided on the GISCI web site (www.gisci.org).

Exam Foundations

The GISCI Geospatial Core Technical Knowledge Exam® is based on a complete job analysis, guided by the Geospatial Technology Competency Model (GTCM), and informed by the GIS & T Body of Knowledge.

The GISCI Geospatial Core Technical Knowledge Exam® is open to all individuals interested in attaining the GIS Professional certification. GISCI will offer the Exam to individuals independent of the application for the portfolio review process. This means that GISP applicants can start the certification process by completing an application and taking the examination any time prior to attaining the professional experience required for the professional portfolio. Exam content will cover the following knowledge areas:

- Conceptual Foundations
- Cartography and Visualization
- GIS Design Aspects and Data Modeling
- GIS Analytical Methods
- Data Manipulation
- Geospatial Data

The exam will be administered by an exam delivery company providing test locations around the US. The Inaugural Exam will be offered by the end of 2015 and test preparation materials will be available on the GISCI web site several weeks prior to the initial examination date.

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United Nations Global Geospatial Information Management (UN-GGIM) 5th Session

By: Valrie Grant, GISP, URISA Board Member

The United Nations Economic and Social Council (ECOSOC) established the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) in July 2011 (ECOSOC resolution 2011/24) as the official UN consultative mechanism on Global Geospatial Information Management (GGIM).

The main objectives of the UN Committee are to provide a forum for coordination and dialogue among Member States, between Member States and relevant international organizations and to propose work plans and guidelines with a view to promoting common principles, policies, methods, mechanisms and standards for the interoperability of geospatial data and services.

The terms of reference approved by ECOSOC call upon Member States to designate experts with specific knowledge drawn from the interrelated fields of surveying, geography, cartography and mapping, remote sensing, land/sea and geographic information systems and environmental protection. The Committee also comprises experts from international organizations who serve as observers. I represented URISA in this capacity.

The Fifth Session UN-GGIM was held from 2-7 August 2015 at the United Nations Headquarters in New York. This session of UN-GGIM brings together senior executives from national geospatial information authorities within Member States, and international geospatial experts from the private sector, non-governmental organization, international organizations and UN bodies from across the globe.

Following a number of important side meetings from August 2-4, the formal Committee session was convened on August 5, 2015. At this Fifth Session, the Committee continued to move forward in fulfilling its mandate to enhance collaboration and support the use of geospatial information to promote sustainable development globally.

The meeting got started with an address from Mr. Wu Hongbo – the Under Secretary General for Economic and Social Affairs. He welcomed the delegates and observers and congratulated the Expert Group for formulating the first geospatial resolution adopted by the United Nations General Assembly in February this year. He further stated that, this landmark resolution recognizes the global importance of location and positioning for many areas of development. Mr. Hongbo said, “2015 is a crucial year in global development, a year in which world leaders will steer the global course of action to improve people's lives and protect the planet. With key finance, sustainable development and climate change conferences being convened, the focus on practical solutions and international cooperation will be imperative. This Committee of Experts, and geospatial information, has a valuable role to play.”

The Expert meeting got under way with the election of Officers followed by the adoption of the agenda which led into the deliberations.

The Delegates and Observers from over 85 countries participated in the deliberations. This was an increase in the participation from last year and it suggests that the Committee is having a more global reach and that there is increased appreciation for the value of Geospatial information in addressing some of our most enduring challenges in line with the Sustainable Development goals. The meaningful contributions of participants in this meeting led to the following key decisions:

1. Sustainable Development and the post-2015 Development Agenda
   a. The Committee of experts noted that the explicit mention of earth observation and geospatial information in the 2030 Development Agenda for Sustainable Development provides a considerable opportunity as objective and authoritative data and information will be needed in a timely manner to support policy and decision makers at all levels.
   b. The Committee of Experts are committed to working with the statistical community both at a national and global level by providing inputs to processes that will develop the global indicator framework. This will be under the auspices of the Inter-Agency and Expert Group on the Sustainable Development Indicators as many goals have a geospatial dimension.
Start reviewing the abundance of education that will be presented at the conference in Spokane this October.

Our Online Conference Program details all of the pre-conference workshops, breakout sessions, meetings, networking events and keynotes. Review the abstract submissions and speaker biographies. Connect with your fellow attendees!

Conference Registration is open and the Grand Hotel is taking reservations for sleeping rooms.

Exhibit and sponsorship opportunities are detailed and available.
c. Stressed the need for supporting the Sendai Framework for Disaster Risk Reduction with the appropriate indicators.

2. Global Geodetic Reference Frame
   a. The Committee of Experts acknowledged the importance of the Global Geodetic Reference Frame Resolution and road map as a critical enabler for member states to leverage the importance of geodetic data sharing, methods, sustainable funding and infrastructure to support growing societal needs - including those for monitoring sustainable development progress.
   b. The Committee of Experts encouraged member states and the working group to commit to undertaking a programme of outreach which capture experiences and best practices for the global geodetic reference frame - particularly in developing countries, in their efforts to develop the road map.

3. Integration of Geospatial, Statistical and other Information
   a. The Committee of Experts appreciated the sharing of national experiences of geocoding and institutional cooperation, as well as the extensive ongoing regional work in this area. The committee also encouraged other regional bodies to contribute to this work so that the Expert Group is able to continue to take the national and regional experiences into account and to build on them; The Committee supported the request by Caribbean member states to encourage the secretariats of regional bodies of CARICOM, OECS and ACS to facilitate mechanisms for the statistical offices and geospatial entities to collaborate on the integration of geospatial information and statistics for regional development.
   b. The Committee of Experts acknowledged that the 2020 Population Census is a welcomed opportunity for integration and also stressed the need to work towards more continuous and dynamic integration of all statistical data and geospatial information, which will create new information systems with enhanced analytical potential.

4. Implementation and Adoption of Standards for the Global Geospatial Information Community
   a. The Committee of Experts adopted the final published ‘Guide to the Role of Standards in Geospatial Information Management’ and the ‘Technical Compendium’ as the international geospatial standards best practice for spatial data infrastructure and encouraged all Member States to adopt and implement the recommended standards appropriate to their countries level of Spatial Data Infrastructure (SDI) Maturity.

5. Legal and Policy Frameworks
   a. The Committee of Experts noted the updates on recent developments and increased focus that could have an impact on legal and policy framework supporting geospatial information. Hence, the geospatial community now needs to be more proactive in the geo-legislative arena, particularly with the immediate issues relating to data collection, use, privacy, provenance, accessibility, use of drones and other potentially intrusive devices.

Over the next year, another major objective of the Committee of Experts will be to ensure that geospatial information is included in the preparation of the indicators to measure the Sustainable Development Goals.

The foregoing were among the major outcomes resulting from the Expert Meeting. What was clear is that geospatial information and GIS will be critical in meeting the Sustainable Development Goals. As geospatial professions we do well to reflect on our role and contribute to the discussion on the geospatial indicators. We should also look for creative ways of helping to sensitize key decision makers as to the power of spatial intelligence recognizing that this cannot be over emphasized in light of advancing the global development agenda.

For more information, visit: http://ggim.un.org/
Advancing the Emergence of GIS as a Core Public Policy Research Tool: A Paradigm Shift Perspective

Dr. Barry Wellar, Director, GIS Retrospective Project Principal, Wellar Consulting Inc. Professor Emeritus, University of Ottawa

“Mining U.S. Federal Agency Materials for GIS Nuggets”, which was published in the May-June, 2015 issue of The GIS Professional, is an overview of the design of the GIS Retrospective Applied Research Seminar, which is to held at the 2016 Esri Federal GIS Conference, February 24-25 in Washington, DC.

The overview notes that the seminar design includes several background reports. The most recent of those reports, The Emergence of Geographic Information Systems as a Core Public Policy Research Tool: Comments on the Paradigm Shift, which was posted in July, 2015, is the subject of this article.

Origins of the Paradigm Shift Report on the Emergence of GIS as a Core Public Policy Research Tool

For the purposes of context, it is instructive to recall that the GIS retrospective research project is organized around the following question:

How can looking back at what has been done, or not been done in the field of geographic information systems (GIS), contribute insights into why and how the field of GIS could and should evolve in the coming years?

And, also for the purpose of context, it instructive to bear in mind that in recent years there has been considerable effort at all levels of government in numerous countries, including Canada, the U.S., Australia, and other countries represented by readers of GIS Professional, to increase the use of GIS technology in the policy formation process, including the policy research aspect.

Three factors in particular led to the decision to prepare the paradigm shift report with a policy research focus.

First, I knew from personal and professional experience that there is a long and substantial body of literature linking policy research with GIS technology and GIScience methodology. Hence, the prospects for successfully mining the policy research/GIS-GIScience literature for GIS nuggets appeared promising to say the least.

Second, I knew from personal and professional experience that issues related to paradigm shifts significantly affect the policy research process in government. And, I also knew from experience, confirmed by feedback from persons knowledgeable in such matters, and examination of the literature, that while there is literature on the paradigm shift topic, relatively little examination of the discussion had been allocated to explaining shifts in the relationship among the qualitative paradigm, the quantitative paradigm, and the visualization paradigm. Hence, the prospects for successfully mining that literature for GIS nuggets appeared promising to say the least.

Third, an invitation to give a presentation to the Friday Lunch Discussion Group (FLDG) in Ottawa provided an exceptional opportunity to “test drive” a presentation.

The long story short is that the FLDG consists of individuals with expertise and experience in the political, policy research, administrative, and scientific aspects of Canada’s federal government. Collectively they could be referred to as les éminences grises, and representative of the kind of “high end” audience which is capable of absorbing and responding to just about any governance topic of one’s choosing.

Given free rein by the Speaker Chair as to topic, members of the FLDG as the audience, and the GIS Retrospective Applied Research Seminar foremost on my consulting work agenda, the choice of topic came easily. I would select a topic that contributes to the seminar, takes advantage of the situation offered by a presentation to the FLDG, and enables me to benefit from previous experience in policy research, in GIS and GIScience research, education, training, and applications activities, and with each of the qualitative, quantitative, and visualization paradigms.

The result is the report, The Emergence of Geographic Information Systems as a Core Public Policy Research Tool: Comments on the Paradigm Shift.

The report is posted, and is therefore available to FLDG members long in advance of the presentation on October 9. It is expected that feedback from FLDG members will address shortcomings of logic in the slides, and will inform me of other errors of omission or commission in time for correction prior to the seminar in late February.

continued on page 12
Preamble to the Slides

It became clear early in the presentation design process that it would be imprudent at best to jump into the slides and start firing away. Rather, it was necessary to “make preparations for the slide deck”, since it seemed likely that there would be something new or at least different in many of the slides for many of the members, and especially for those with limited exposure to GIS technology and/or GIScience methodology. Indeed, advisors to the GIS retrospective project suggested that the introduction to the slides should provide policy research guidance, even for those FLDG members with experience in GIS and GIScience.

The point of concern is that someone having expertise in all three of the qualitative, quantitative, and visualization paradigms is more the exception than the rule. As a result, it would be appropriate to provide an orientation or lead-in statement to the slides, including a selection of links or references for those who wish to do some research prior to the presentation.

In the remainder of the article I insert a brief rationale (in italics) for the Background and Introductory Remarks sections in the preamble to the slides. These comments may be useful for readers who are invited or directed to explain such matters as:

- Why GIS technology and GIScience methodology are core research tools in the geospatial policy domain;
- Why and how policy research paradigms shift; and,
- Why the current relationship among the qualitative, quantitative and visualization paradigms should be shifted.

Establishing Credentials.

(Comment: Members of the FLDG were ‘big dogs’ or ‘ran with the big dogs’ back in the day. By nature they will want to know what I have to offer, and why they should pay attention.)

Two items of context may be useful as a means of establishing my association with the presentation topic, The Emergence of Geographic Information Systems as a Core Public Policy Research Tool: Comments on the Paradigm Shift.

I went to graduate school at Northwestern University in the 1960s, with support by Canada Mortgage and Housing Corporation, and funding and research support from a number of U.S. federal government agencies and programs, including: NASA; Geological Survey; Housing and Urban Development; Health, Education and Welfare; the National Cooperative Highway Research Program; and the Census Bureau.

During that time, and for the next three years while on faculty at the University of Kansas, I was in the midst of theoretical and applied research involving two of the paradigms central to today’s presentation:

- The development and use of quantitative methods and techniques for public policy, program, plan, and operations purposes; and
- The design and application of geographic information systems (GIS) and components of GIS in the executive, management, and operations functions of governments at all levels.

Information about published reports, research projects, etc., regarding the early days of my career formation can be viewed in the C.V. section of my website (http://wellar.ca/wellarconsulting/).

Government Experience

(Comment. In general, professors undertake curiosity-driven research, and members of the FLDG undertake client-driven research, and occasionally there are those who have done or do both. In this case a brief recall of my government career could provide comfort for those concerned that I might be an ‘ivory tower professor’ with no hands-on experience in the policy process.)

When I returned to Canada in 1972 to join the federal Ministry of State for Urban Affairs, I carried on those lines of applied research as a senior research officer, urban information coordinator, assistant director of data processing, policy research advisor, director of non-metropolitan community development, and senior policy advisor.

For seven years I had first-hand experience with proposing, testing, and using all three paradigms – qualitative, quantitative, visualization – in public policy research that included contributions to OECD and UN panels and committees, to inter-departmental and inter-governmental committees, to Cabinet Documents, and numerous communications “up the ladder” to DGs, ADMs, DMs, Secretaries, and Ministers.

The GIS Retrospective Project

(Comment. During their careers, members of the FLDG would have contributed to the literature on a number of policy research matters. The GIS retrospective project would therefore strike a familiar chord, since very few if any policy and policy research issues, initiatives, activities, etc., that are of current concern have little or no history. Rather, their origins could be 10, 20, 40, or a 100 years ago, and a presentation invoking the retrospective approach might well be very near and dear to the hearts and minds of FLDG members. As a result, FLDG members are an ideal sounding board and feedback group when it comes to identifying the drivers behind shifts among the qualitative, quantitative, and visualization paradigms in policy research, and the emergence of GIS as a core policy research tool.)

The invitation to address the Friday Lunch Discussion Group (FLDG) came at an opportune time, because I am
in the midst of a consulting assignment which ties back to work and activities that marked the onset of my professional career some 50 years ago, and are described above.

In brief, based on a retrospective project in 2013 which re-visited papers in proceedings published 30 years earlier (Proceedings of the Sixth International Symposium on Automated Cartography), I was retained to organize the colloquium, “Using the Retrospective Approach to Mine for GIS Nuggets”, which was held February 13-14, 2015, at the Environmental Systems Research Institute (Esri) campus in Redlands, CA.

And, as a follow-up, I have been retained by Esri to organize an Applied Research Seminar, “Mining U.S. Federal Agency Materials for GIS Nuggets”, which is to be held in February in Washington, DC during the 2016 Esri Federal GIS Conference.


The objectives are outlined as follows for the purposes of this presentation.

First, and consistent with a primary axiom of methodologically designed inquiries, the GIS retrospective research project is organized around a question:

How can looking back at what has been done, or not been done in the field of geographic information systems (GIS), contribute insights into why and how the field of GIS could and should evolve in the coming years?

With that question providing an overall sense of purpose, the 2015 colloquium and the 2016 seminar are important events in the process of elaborating what we can learn from the past, and how we can learn from the past, to inform the futures of three core, related missions:

1. Designing, developing, and implementing geographic information systems (GIS) technology;
2. Defining and elaborating the methods, techniques, and operations of geographic information science (GIScience); and
3. Using geographic information systems technology and/or geographic information science in government, academia, business, the media, and other organizations, as well as by individuals, community associations, and other interests.

FLDG as a Key Audience for a Trial Run of the Policy Research Paradigm Shift as a GIS Retrospective Topic

(Comment. The FLDG is a rare assembly when it comes to policy research and paradigm shift expertise and experience, so the invitation to address the FLDG is very much appreciated. If all goes well, an FLDG member or two will become involved in the paradigm shift aspect of the GIS retrospective project.)

One of the topics to receive explicit consideration in discussions with U.S. federal agencies about their presentations at the 2016 seminar involves the three paradigms. Drafting my FLDG presentation at this time (July) is an opportunity for me to accelerate my thinking in that respect.

Further, the FLDG meeting in October is an opportunity for me to obtain insights about the paradigms during the Q&A session, and to raise issues which FLDG members may wish to address at a later date.

At a general level, then, my association with the theme of this presentation began about 50 years ago in graduate school, and continued through career stops in academe, government, and business involving education, training, research, applications, and management experiences.

And, at a more particular level, the theme of the presentation falls within the purview of the retrospective research projects that I have been undertaking in recent years with the support of Esri, which itself is a prime mover and shaker in the paradigm shift process.

Exploring the Emergence of GIS as a Core Policy Research Tool, and Emphasizing the Spatial Factor as the paradigm Shift Driver

My mission is to outline what I believe to be a significant shift among the paradigms which characterize the public policy research process in federal, provincial, and local governments in Canada, and in numerous other countries.

The long story short is that each of the three core paradigms – qualitative, quantitative, visualization – has its moments as “the big dog” under various circumstances, but I believe the evidence underlying the topic of this presentation is clear and compelling: Namely, a significant shift has occurred in the share of regard allotted to each paradigm in the policy research arena over the past four or five decades on numerous matters of a spatial, i.e., geographic nature. Additional comments on this development are presented in the latest edition of ArcNews, and can be viewed at: http://www.esri.com/esri-news/arcnews/summer15articles/policy-makers-increasingly-use-
That is, the visualization paradigm, aided and abetted by geographic information system (GIS) technology, is occupying an increasingly pre-eminent and in some jurisdictions a dominant place in policy research initiatives when it comes to dealing with problems, concerns, and issues associated with entities and conditions which have a spatial dimension. The following are among the hundreds of federal, provincial, and municipal policy research domains which have a spatial or “where” aspect: active transportation (cycling, walking); aggregate extraction; agricultural land reserves; airports; air pollution sources and sinks; building codes/standards; business districts; climate change; community mail boxes; election district/ward boundaries; and emergency measures deployment (local, regional, national scales): energy production, distribution, consumption; environmental protection; environmentally sensitive areas; fisheries; forest resources and practices; fossil fuel production, distribution and consumption; “gridlock”; habitat gain/loss; heritage buildings; highway networks; housing; hydro-electric power generation, transmission, and consumption; land use zoning and re-zoning; landfill siting; manufacturing plants; mine tailing pond locations and standards; neighborhood intensification; pesticide spraying regulations; public safety; rail freight and rail passenger services; regional development; siting of public institutions (military bases, schools, hospitals, correctional facilities, arenas, skateboard parks, swimming pools, bridges, docks, wharves, rescue stations, recreation centers, public housing complexes; half-way houses, recycling facilities, etc.); solid waste disposal; toxic waste disposal; traffic congestion; transit infrastructure; urban development; urban sprawl; and, water bodies and drainage areas; water and wastewater systems; wetlands; and wind turbines.

In this presentation I use a selection of talking points to illustrate the policy research paradigm shift which has occurred, is occurring, and which will continue to unfold in various ways in the over the coming decades. The presentation is set at an overview level. This approach allows highlighting the critical points in a general way, and to avoid becoming bogged down in mind-numbing details.

As may be expected, I have produced a number of reports on geographic information systems technology and its applications, geoscience methodology, the retrospective research project, and on many of the topics mentioned above. They are posted on my website, http://wellar.ca/wellarconsulting/, as well as on other websites including: http://www.transport-action.ca/en/wellar.html; https://www.google.ca/#q=urisa+wellar&nfpr=1; and, http://www.slideshare.net/wellarb/presentations/2.

Finally, to broaden the literature search and review opportunities for anyone seeking a wide-ranging discussion of geographic information systems (GIS) technology and applications, I recommend a visit to several of the following websites:

http://www.esri.com/
http://www.esri.com/esri-news/arcnews
http://www.esri.ca/en
http://www.urisa.org/
http://www.urisa.org/resources/the-gis-professional/
http://www.urisa.org/resources/books-and-resources/#foundationsURISA
http://www.cag-acg.ca/en/GIS_day.html
http://www.cartogis.org/about.php
http://canadiangis.com/geo-listings/gogeomatics-canada
http://www.cihar-irsc.gc.ca/e/48922.html
http://www.ducks.ca/what-we-do/gis/

Comments or questions about the Applied Research Seminar, Mining U.S. Federal Agency Materials for GIS Nuggets, may be sent to: wellarb@uottawa.ca.

Download the full report: The Emergence of Geographic Information Systems as a Core Public Policy Research Tool: Comments on the Paradigm Shift, including the slides.
If you’re reading this, it’s likely you’ve designed and created a map. Maybe, you’ve authored hundreds of maps. Either way, you may find this book review helpful in planning your next book purchase. GIS Cartography is an adequately comprehensive resource for map designers. Students and novice map designers will benefit greatly by this resource, but even the seasoned cartographic professional can glean some useful information from it. The author aims to inspire map designers and guide them through fundamentals and best practices that improve the reader’s cartographic understanding, work quality, and communication effectiveness. The first edition of this book sold well and received many good reviews. The second edition includes a new chapter on digital cartography and has been redesigned to have study questions and exercises at the end of each chapter. The latter makes it a good choice as a textbook for students learning about cartography and map design.

I was immediately hopeful when the author noted that this book was not ‘a how-to’ book nor a ‘step-by-step’ book. Instead, as the subtitle reveals, this is A Guide to Effective Map Design that begins by awakening our creativity and ends with colorful examples of professional maps and color swatches. The content in-between is informative, but lacks impact due to excessive text and limited visual examples. Much of the visually appealing content is included in the Appendices.

The first two chapters introduce us to the concept of map design and insist that we can be creative. Interestingly, the author references a book called Drawing on the Right Side of the Brain, which aims to deepen readers’ artistic creativity. Likewise, Gretchen Peterson seeks to deepen our cartographic creativity. Her insightfulness and set up is summed up on page 16 when she says “Sometimes we are stifled by our own desire to start from scratch and thereby create a truly original work, thinking that this is the way that everyone does it.”. The point is that our innovation is rooted in traditional concepts; and those concepts are covered in detail in this book.

The next several chapters walk us through layout design, fonts, colors, and features. The content can be boring, but if you’re seeking a better understanding, the message is enlightening. The subject of fonts was particularly interesting to me as fonts are important aspects that are often overlooked as we focus more on feature content and display. The discussion on color was very thorough and I was happy to see that the author referenced the ColorBrewer tool, which has been very helpful for me in selecting great color ramps for various scenarios. If you’re at all curious about the differences among RGB, HEX, CMKY, HSV, HCL, and CIELAB this chapter is for you. Frankly, the features chapter was basic. Anyone paying attention to the maps around them will know how to apply symbology to roads, water, and other common map features. The feature examples left a lot to be desired. Frankly, many of the figures used in this chapter appeared amateurish and unpleasing to me. The most irritating figure and the one where the author lost some credibility was Figure 6.42 where the notorious Esri flat-tip arrowhead is used to show the use of elongated arrows. At first, I thought this was a ‘what not to do’ example, but sadly it was a serious example that could have been improved with some symbol property adjustments.

The author regained credibility in the last three chapters that focus on static maps, projections, and web map concepts. The chapter about map projections was informative, but needed more illustrations as there were seven pages of solid text. The book ends with three Appendices that include layout sketches, map examples, and color swatches. The map example appendix is fantastic and the most visually impactful part of the book. Given the complexity of cartography, the map example appendix serves as a recap of the major topics conveyed in the book -- my favorite of which is Figure B.10 designed by Kyle Schaper for a GISCI contest.

The author, Gretchen Peterson, is a well-known geospatial professional and data scientist who focuses on cartographic visualization through her books and blogs. She clearly lays out the fundamentals of good map design in this book, but also leaves the reader with study questions and exercises that make you think about and apply what you’ve

continued on page 16
read.

GIS Cartography, is best suited for students and novices in the science of map design. It contains informative content and examples, but is a little dry at times and could benefit by more visual examples of the concepts and principles conveyed in the text. As the author eloquently states in Chapter 5, “We ought not to feel constrained by convention, but rather guided by it.”. So, let this book be one of several that guide you along the path to creative and effective map design.

**Reviewer:** Jim Thomas is a professional geoscientist at Golder Associates. He’s been creating maps and managing spatial data since 1996. He holds a B.S. degree in Earth and Environmental Science and, is a licensed professional geologist in Florida, and a certified GISP.

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**URISA Board Election Results Announced**

URISA is pleased to announce the results of its 2015 URISA Board of Directors’ election. Tripp Corbin will serve in the position of President-Elect and Stephen Berry, Keri Brennan and Corey Halford will serve as Directors. They will all begin their three-year terms at the conclusion of GIS-Pro & NWGIS 2015 in Spokane, Washington this October:

**PRESIDENT-ELECT: Tripp Corbin, GISP (eGIS Associates, Inc - Dacula, Georgia)**

Tripp Corbin will serve as President-Elect for one year and his term as President will begin at the conclusion of the 2016 conference in Toronto. He is looking forward to leading the organization. “I am truly humbled to have been elected by you, URISA’s members, to this position. There are many challenges facing our industry and URISA. I look forward to working with my fellow board members, URISA’s staff and most importantly, our members, in facing these challenges and setting the course to meet them. This is an exciting time for URISA and the GIS profession. My proverbial door is always open. So if you have an idea which will help make URISA a stronger and better organization for our members and the community, please feel free to pass it along. Thank you once again for the trust you have placed in me.”

**BOARD MEMBERS:**

- **Stephen Berry, GISP (Clark County Consortium for GIS – Winchester, KY)**
- **Keri Brennan, GISP (The Schneider Corporation – Indianapolis, Indiana)**
- **Corey Halford, GISP (City of Airdrie, Alberta Canada)**
- **Rebecca Somers, GISP** was elected by the membership as President-Elect last year and will begin her term as President of the association at the conclusion of the Spokane conference.

The three-year terms of service for the following URISA Board members will conclude in Spokane:

- **Allen Ibaugh AICP, GISP - Data Transfer Solutions (Florida)**
- **Doug Adams, GISP - Baltimore County, Maryland**
- **Danielle Ayan, GISP - Booz Allen Hamilton (Georgia)**
- **Claudia Paskauskas, PMP, GISP, SSGB, MCSD - VHB, GMB Engineers & Planners, Inc. (Florida)**

We thank them all, in advance, for their amazing dedication and service to URISA.
“Building Points”—Mistake or Half Step?
By F. Peirce Eichelberger, gdbms, Inc.

Have chatted with a number of people lately and the notion of building points has come up. It wasn’t that long ago that we thought that if we needed building data we could look at the aerial photos (and now the obliques) to get the building detail we needed. The GIS and CAMA people have also spent the last 20 years doing integration, sketches and floor plans (Do not miss the 20th anniversary GIS/CAMA conference in Savannah, GA February 22-25 next year.)

Now people are talking about a direct GIS tie to the buildings via the use of building points. As we can calculate a Centroid for a polygon, such as a parcel, we may not have the buildings described to the GIS as polygons. Building points are “placed” to describe the “location” for an address or building name. What’s missing is the vertical or z dimension of the above (or below) grade occupancy. While any definitive work is good for assigning and storing/displaying addresses, building points are just a half step in the right direction. We must realize that many buildings may have multiple entrances, some times off of different streets. As described in an early URISA paper (1986 Proceedings, Volume II) “Land/Structure/Occupancy Database Design: Handling an Increasingly Complex Urban Reality” the structures and occupancies of the built environment need to get their due!

We are finding that the “occupancies”, where people live and work, need to be a fundamental component of our GIS data structures. This means that we must move to a better three-dimensional GIS model and a better time slice or four-dimensional model as well. In GIS we can no longer afford to be two dimensions behind. This 3-D GIS model must be analytical, not just visual.

It may be easier to talk about 3-D/4-D GIS when we embrace the true need for Enterprise GIS that can support such applications as:

- Generate a list with occupancy/apartment number of every living unit in a small area of your jurisdiction, for Census local review and school planning, time of day evacuation notifications
- Show me where every business license exists by suite/room number, cross reference by fire permits to indicate “hazardous” occupancies
- Show me the locations of every business that may have employees for local earned income tax reporting
- Identify any buildings that are in the floodplain or near steep slopes
- How many feet is it from the curb at ground level to the 15th floor elevator core, or
- What subterranean utility easements overlap in the right-of-way?

Closely allied with this discussion is the idea of “subparcels” and the need to more fully describe them to GIS as well. See Fair and Equitable “The Rise of Subparcels” February, 2012 for more details.

Part of this discussion includes the work of the survey community to have better as-built dimensions, including “z” coordinates on many more things of interest. Some other interesting work is ongoing in the building/development industries as they adopt BIM (Building Information Modeling) techniques for full 3-D analytical abilities (not just visualization) and full life-cycle (time slice) data structures. Other work is needed to better define vertical datums for a county, but also to better describe property specific (localized) at grade “elevations”, for example the site’s ground level, etc. Increasingly we may need to identify more subterranean features, as well, like below ground parking, multiple buried easements/utilities, etc.

Also think about the need to provide better frameworks for all the external data that is becoming rapidly available:

- NG/E-911 calls
- Everyday cell call locations and times
- Cell call monitoring data
- WIFI locations and addresses
- Landlines (still)
- Cell numbers and email addresses
- All business and residence locations
- Easements and other land records
- Other external maps

Think about some next steps—some demonstration projects with surveyors and BIM knowledgeable folks?

Look for more from the professional practice initiative on GIS and surveying.

Interested? Email me at peirceeichelberger1@mac.com for more information or references.
Welcome New URISA Members

Allen Adams, GISP—Leon County Property Appraiser—Tallahassee, FL
Douglas Albert, GISP—Louisiana Department of Administration—Baton Rouge, LA
James Albert, GISP—LDA Engineering—Knoxville, TN
Roddy Annan, GISP—Town of Leesburg—Winchester, VA
Gregory Bacon, GISP—Fairfax County—Alexandria, VA
Laura Benneyworth, GISP—Vanderbilt University—Nashville, TN
Amanda Bishop, GISP—Marion County BOCC—Ocala, FL
Koya Brown, GISP—Georgia Power Company—Atlanta, GA
Rajesh Bubuk, GISP—Microcenter—Manama Bahrain, Bahrain
Joe Burgess, GISP—Dewberry—Alexandria, VA
Matt Burmeister—Chicago, IL
Kayhla Carey—Laramie Police Department LARC Division—Laramie, WY
Laura Castelnuovo, GISP—Lakeland, FL
Deming Chen, GISP—Prince George's County—Greenbelt, MD
Crystal Childress, GISP—Woolpert Inc—Dayton, OH
Grace Chua Corn, GISP—Orange County Public Works, Stormwater Mgmt.—Orlando, FL
Wesley Cleland, GISP—Arkansas Game and Fish Commission—Fort Smith, AR
Aaron Collins—Columbus Water Works—columbus, GA
Shaun Conway—Lynchburg, VA
Dennis Corvi—Milton, MA
Matthew Cosler, GISP—US Army—San Antonio, TX
R. Michael Cousins, GISP—OHM Advisors—Farmington Hills, MI
Leslie Couvillion, GISP—Coastal Environments Inc—New Orleans, LA
Maggie Cowling—Dallas, TX
Cory Cunningham—Calgary, AB Canada
Jacob Darrah, GISP—Blue Mountain Inc.—Maidsville, WV
Morgan Dean, GISP—Texas Commission on Environmental Quality—Pluggerville, TX
Donna Dexter, GISP—Marion County BOCC—Ocala, FL
Tarik Dixon, GISP—National Spatial Data Management Division—Kingston, St Andrew Jamaica
Michael Dodd—CH2M—Canmore, AB Canada
Sean Dolan, GISP—Booz Allen Hamilton—Alexandria, VA
Joseph Eberts—City of Portage—Portage, IN
Andrew Edmonds, GISP—NC Historic Preservation Office—Durham, NC
Robert Esparza, GISP—Imperial Irrigation District—Imperial, CA
James Evans—Pelham, AL
Natalie Fisher, GISP—EPDOR Water Services—Edmonton, AB Canada
Johh Fox—Bossier City, LA
Bryan Frazar—Louisville Metro Government—Louisville, KY
Abigail Gleason—St. Louis, MO
Maha Habbal—Fairfax, VA
Mike Hadley, GISP—Eagle Mountain City—Eagle Mountain, UT
Chris Hampel, GISP—Vancouver, BC Canada
Kristen Hestir, GISP—InDyne Inc.—Las Cruces, NM
Tyson Hoffman—Seattle, WA
Yi Hou, GISP—CDM Smith—Dallas, TX
Lisa Huggins, GISP—UNC-CH—Chapel Hill, NC
Chad Huntington—City of Burnaby—Burnaby, BC Canada
Christine Johnson, GISP—Stanlee—Reno, NV
Colin Johnson, GISP—Dewberry—Mount Holly, VA
Patrick Kane—Mount Laurel, NJ
Ryan Kelso, GISP—Lewis County Public Works—Chehalis, WA
Shannon Knox, GISP—North Texas Municipal Water District—Richardson, TX
Ryne Knuckles—Tuscaloosa, AL
Tamara Koliubki—St. Albert, AB Canada
Vamshi Konduru-Narsimha—Spalding DeDecker—San Antonio, TX
Elizabeth Lane, GISP—U.S. Forest Service—Taos, NM
Jason Latoski—Interwest Consulting Group—Elk Grove, CA
Amber Lauzon—Portland, OR
Joel Lawhead, GISP—Nvision Solutions Inc.—Bay Sain Louis, MS
Michael LeBlanc, AICP, GISP—Lafayette Consolidated Government—Lafayette, LA
Cheryl Lemon, GISP—Aspire Energy—Apple Creek, OH
Melissa Leonard, GISP—AECOM—Cool Ridge, WV
Dapeng Li—Salt Lake City, UT
Prasad Lingam—Pune, Maharashtra India
Richard Littlefield, GISP—City of Almatonoe Springs—Winter Park, FL
Byron Lloyd, GISP—Stantec—Airdrie, AB Canada
Vinh Ly, GISP—Black Gold Emergency Planners Inc.—Victoria, BC Canada
Dominic Marchionna, GISP—Prince William County—Woodbridge, VA
Stephen Mauel, GISP—WI Geological & Natural History Survey—Madison, WI
Mark McPherson—Portland, OR
Barry Miller, GISP—National Geospatial-Intelligence Agency—Clarksville, TN
Eric Morris, GISP—The Baldwin Group, Inc. at NOAA—Charleston, SC
Lucas Murray—Glendale, AZ
Kevin Nichols, GISP—AECOM—Pittsboro, NC
Joel Nickerson—Woolpert Inc—Denton, TX
Jeffery Olson, GISP—Until—Hampton, NH
Craig Ostrom, GISP—Fort Wainwright, AK
Jessie Pellerin, GISP—State University of NY (SUNY) at Albany—Craspeville, NY
Carol Placchi, GISP—IndyInc, Inc.—Las Cruces, NM
Tara Preston, GISP—City of Bozeman—Bozeman, MT
Michael Pritchard, GISP—Del-Co Water Co, Inc.—Delaware, OH
Devaraju Raju, GISP—Microcenter—Al Asimah, Bahrain
Andres Rea, GISP—American Water Works—Marina, CA
Jon Rees, GISP—Johnston, IA
Nicole Reynolds, GISP—Leidos—Orlando, FL
Brandy Riche, GISP—Pierce County IT/GIS—Tacoma, WA
Nathan Rinehart, GISP—ErSafe Inc.—Nashville, TN
Jeremy Ripin—Ashland, MA
Justin Roberson, GISP—Fairfax County Park Authority—Reston, VA
Tiki Rysen—Fehr Peers—Seattle, WA
Brian Schnick, GISP—Army Corps of Engineers—College Place, WA
David Schoenfeld—Kenton, WA
Thomas Schofield, GISP—Warner Robins, GA
Mark your calendar for the 8th URISA Caribbean GIS Conference!
September 5-8, 2016 - Barbados Hilton

Submit your abstract by December 1, 2015

URISA is thrilled to be heading back to Barbados for the 2016 URISA Caribbean GIS Conference. Barbados was the site of our second conference in 2004. The conference is organized by a committee of Caribbean GIS experts, who dedicate considerable time and energy to developing an important educational program. The conference features an Exhibition and a number of professional development and networking opportunities.

The Conference Program is developed through a Call for Presentation Proposals. Consider the following list of suggested topics for consideration (note that all abstracts received will be reviewed and considered for the conference program regardless of the list below):

- National SDI implementation
- Mobile technology and field data collection
- Climate change
- Collaboration, coordination and cooperation across departments, agencies, ministries, regions
- GIS management challenges and best practices
- Sustainable capacity building
- Water resources
- Standards, Policy
- Modern Geodetic Framework
- Big data to support planning and development
- Web solutions
- Business intelligence and analytics
- GIS in support of economic development
- GIS in public safety, emergency response and disaster management
- Improving addressing
- Landuse planning
- Coastal and marine spatial planning
- Environmental monitoring and analysis
- Commercial applications including retail, insurance, manufacturing, financial services
- The use of location technology
- Land/Parcel management
- GIS in the ‘Cloud’
- How to prepare/use Census GIS
- Citizen’s use of GIS - web access
- Aerial imagery and LiDAR
- Use of drones/UAVs for collecting imagery
- Innovative health GIS applications
- Crowdsourcing
- Oil and gas
- Enterprise GIS trends
- Open Source GIS
- PPGIS - community participation
- Developing GIS leaders in your organization
- Data management challenges
- Standards implementation issues and experiences
- Data sharing, open data
- Creative funding solutions
- Other topics

Abstract Submissions are due by December 1, 2015.
For more details and the online submission form, proceed to: http://www.urisa.org/education-events/urisa-s-caribbean-gis-conference/
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Cyclomedia is the market leader in systematic imaging of large-scale environments from cities to complete countries. Cyclomedia’s smart imagery solution creates Cycloramas - 360-degree panoramic photos – with high accuracy, providing current and clear views of street-level environments.

The Cyclomedia recording system is like no other. It uses patented technology to determine the exact position and orientation of every picture taken. By creating a dense network of geometric street images, Cycloramas are always focused on the correct address or feature from multiple vantage points.

Our solution revolutionizes the way asset and property assessment is managed and reported. It reduces field visits and provides accurate feature measurements with convenient spot-checking. It simplifies maintenance and enables automated inventory and controlled processes. It also saves valuable resources while simplifying the decision-making process, improving operations and increasing efficiency.

We provide ready-made solutions throughout Europe, North America, and Asia. Our technology is widely used in government GIS, public safety, and security markets, as well as in construction, infrastructure management, and insurance.

We provide a full range of services related to 3D mobile mapping. Data is captured and delivered worldwide.

Our primary market segments include:

• Property Taxation, Appraisal, and Building Inspection
• Transportation and Infrastructure Management
• Public Safety and Homeland Security
• Engineering and Construction Planning

Cyclomedia offers the following licensed products:

Content
• Cycloramas – Seamless, accurate 360° panoramas taken at street-level with our patented recording technology.

Viewer Software
• GlobeSpotter – Our feature-rich web app for viewing Cycloramas that runs on any browser supporting Flash.
• GlobeSpotter for ArcGIS Desktop – The power of GlobeSpotter inside Esri’s leading GIS software.

Hosting Solutions
• GlobeSpotter Cloud — Secure, scalable hosting service managed by Cyclomedia that’s free to customers.
• GlobeSpotter Server – Locally hosted option supporting all Cyclomedia’s content and software.

Developer Tools
• GlobeSpotter API – Integrate GlobeSpotter components into your user’s existing business workflow.
• Panoramic Rendering Service — Extract pictures for reports and texture map buildings with Cycloramas.

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Pioneering work in geomatics and spatial data conversion quickly established this Maine-based company as a key player in the GIS software field. Today GIS professionals are turning to Blue Marble for Global Mapper a low cost, easy to use yet powerful GIS software tool that everyone can afford and use. Blue Marble is known for coordinate conversion and file format expertise and is the developer of Geographic Calculator, GeoCalc SDK, Global Mapper and Global Mapper SDK.

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Part of Hexagon, North West Group is comprised of North West Geomatics Ltd. (NWG) and Valtus Imagery Services. NWG is a leading aerial data acquisition company, dedicated to producing high-quality digital aerial imagery and related spatial data, while Valtus provides an easy and reliable storage, management and distribution solution for imagery data.

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eGIS Associates, Inc. is focused on providing efficient and cost effective Geospatial Solutions that meet the growing needs of public and private sector enterprises. Our mission is to help you consume the “Power of Place” with current technology standards and Applied Spatial Intelligence ©. eGIS offers a wealth of professional products and services including: Enterprise GIS Implementation, Application Development, Business Systems Integration and Geospatial Training and Support. eGIS is committed to customer satisfaction – Relationships Matter. Whether you need advice on your project or are looking for a relevant product or just have a technical question, contact us today.

digraphIT
digraphIT® offers the depth of experience, insight, and innovation that only comes from more than two decades of GIS consulting, custom software development, and system integration projects successfully completed for state and local governments, utilities, transportation, and law enforcement sectors. Technologies have changed significantly since the early days of GIS, allowing for tightly coupled GIS/IT system integration, deployment on multiple platforms, and quicker implementation of cost-effective solutions. Founded in 1990 as Advanced Technology Solutions Inc., we were a pioneering GIS consulting company in Pennsylvania when GIS commercialization was still in its infancy. We rebranded as digraphIT in 2007 to highlight our comprehensive and competitive offering of geospatial services.
and solutions. Contact us today (marketing@geographit.com) if you are looking to start GIS or improve the efficiency of your legacy GIS and IT systems.

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With offices in Kingston, Jamaica (876-970-5686) and Georgetown, Guyana (592-227-0433)
www.geotechvision.com
GeoTechVision focuses on “Delivering Value through Innovative Solutions!” We have been assisting Caribbean Businesses, Agencies and Government Ministries to develop and effectively use spatial intelligence in critical decision making! We are very involved with establishing Geographic Information Systems, GPS and Mobility products and solutions, as well as marketing our own “GeO” brand tablet. We consider Human Capacity Building as very critical - right from the classroom to the work environment. Hence our Classroom Management Solution and our strong focus on Training and Development in all our engagements. Our other consulting services include Project Management, Information Security Advisory, Process Audit and Assurance, Business Analysis and Enterprise GIS solution planning and implementation.

MGP
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MGP is an information systems services company that specializes in geo-spatial solutions. Our comprehensive range of geographic, data modeling, and business process solutions provide you new opportunities to find a better way. We believe that innovation creates opportunity and collaboration breeds success. MGP was formed as a shared business model in which clients are partners. This philosophy enables significant cost savings and makes it possible for any client, regardless of size, to get where they need to go. MGP is the managing partner of the GIS Consortium.

Open Spatial Corporation
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Contact: Colin Hobson
Open Spatial is a multi-national company delivering geospatial solutions based on Oracle and Autodesk technologies. Recognized for delivering applications to government and utility sectors, our solutions are based on internationally accepted open standards and world-class best practices. Open Spatial offers innovative spatial infrastructure solutions to managing spatial data from survey through to design, construction and ongoing spatial data management. Our clients efficiently manage cadastre, water, wastewater, stormwater, roads, electric and fiber networks.

Planning Communities, LLC
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Planning Communities, LLC provides a wide range of multi-disciplinary planning services for local, state and federal agencies, tribal nations and community organizations. Community, transportation, environmental and GIS services include local/regional planning, visioning/scenario planning, land use, socioeconomic, market and cost-benefit analysis, community asset mapping, tool/application support and development, process improvement/integration, consensus-building and facilitation.
Headquartered in Raleigh, North Carolina, Planning Communities has additional offices in Charlotte (NC) and Seattle (WA). Planning Communities is a North Carolina certified Small Professional Service Firm (SPSF) and is certified as a DBE in North Carolina, Tennessee, Florida and Delaware.

Temporal Geo Analytics
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Temporal Geo Analytics, Inc. (TGA) is a Land Use and Environmental Litigation consulting firm. We have expertise in using Geographic Information Systems (GIS) to develop, manage, and distribute complex spatial databases, as well as creating the presentation-quality visualizations and graphics needed for natural resource litigation and land use projects.
TGA specializes in the analysis of multi-faceted land use issues and environmental impacts over time. TGA is expert at acquiring and integrating historic and current spatial data to build the critical information you need to represent your case.
Using GIS, we transform complex issues into defensible, authoritative, and easily understood maps and graphics. Our clientele consists primarily of natural resource and environmental attorneys, oil and gas companies, mining companies, and land developers.

For information about URISA Partnership, please visit:
http://www.urisa.org/about-us/become-a-urisa-partner/ or contact Wendy Nelson at URISA Headquarters.
Leveraging GIS for Environmental, Natural Resource, and Land Use Planning is our core expertise. Geographic Information Systems (GIS) integrate and overlay unlimited layers of themed spatial and tabular data to illustrate and reveal patterns, context, and the intrinsic qualities of any location. A GIS is also a powerful analysis tool capable of querying data for location and its relationship to overall context. At TGA, we have an intimate understanding of these tools and their capabilities.

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**Wellar Consulting**  
Ottawa, ON Canada  
Phone: (613) 728-3483  
wellarb@uottawa.ca  
Wellar Consulting services include design and evaluation of education and training courses and curricula for GISystems and GIScience programs; advice and workshops on the development of quantitative measures to assess information system and transportation system performance; critical reviews of IS and GIS RFPs; seminars on the safety and security aspects of interdependent infrastructures; professional opinion on land use planning and zoning issues; and, expert opinion on liability for safety-related incidents involving pedestrians, cyclists, and motor vehicle operators.

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- Certificate in Geographic Information Systems (GIS)
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