Should GIS Professionals be Certified? If so, How?

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An Idea Whose Time is Upon US

• Surveyors saying that a person should be licensed or certified in order to create or maintain public geographic information
• Employers (particularly H.R. officers) asking, “what is a GIS Professional” and “why should we create a new job classification?”
• Students and Universities wondering what is an appropriate course of study for a GIS professional.
Is there a GIS Profession?

ATTRIBUTES OF A PROFESSION
(Pugh as reported in Obermeyer)

- Specialized body of knowledge
- Mission
- Formal organization
- Common language
- Specialized training
- Culture and lore
- Code of Ethics
- Licensing/Certification


Number of Staff Working with GIS

<table>
<thead>
<tr>
<th></th>
<th>1996</th>
<th>1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARGE CITIES &gt; 100,000</td>
<td>7.84</td>
<td>9.86</td>
</tr>
<tr>
<td>SMALL CITIES 25,000 - 100,000</td>
<td>1.96</td>
<td>3.54</td>
</tr>
<tr>
<td>LARGE METRO COUNTIES &gt;25,000</td>
<td>8.66</td>
<td>11.45</td>
</tr>
<tr>
<td>SMALL METRO COUNTIES 50,000 - 250,000</td>
<td>6.54</td>
<td>8.45</td>
</tr>
<tr>
<td>ALL JURISDICTIONS</td>
<td>5.00</td>
<td>7.03</td>
</tr>
</tbody>
</table>

The Market for GIS Professionals

83,000 Units of Local Government

X

6 GIS Professionals per Site

means

A HALF-MILLION GIS PROFESSIONALS NEEDED FOR LOCAL GOVERNMENT!

2000 URISA Salary Survey

RESPONDENTS: 837

AVERAGE SALARY BY JOB CATEGORY

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Percentage</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIS MANAGER</td>
<td>22%</td>
<td>$54,091</td>
</tr>
<tr>
<td>GIS COORDINATOR</td>
<td>14%</td>
<td>$44,063</td>
</tr>
<tr>
<td>GIS SPECIALIST</td>
<td>12%</td>
<td>$46,807</td>
</tr>
<tr>
<td>GIS SYSTEMS ANALYST</td>
<td>8%</td>
<td>$49,426</td>
</tr>
<tr>
<td>GIS DATA ANALYST</td>
<td>7%</td>
<td>$40,433</td>
</tr>
<tr>
<td>GIS TECHNICIAN</td>
<td>5%</td>
<td>$30,962</td>
</tr>
</tbody>
</table>
Answers to the Question

• Is there a profession?  
  Yes
• Are a significant number of people working with GIS?  
  Yes
• Does it pay like a profession?  
  Sometimes

Calls for GIS Certification

• Different interests in this issue ... find benefit
  – GIS professionals – looking for ways to document their expertise and set themselves apart from other job candidates
  – Employers – wanting to ensure the people they hire will be competent and ethical
  – Higher learning institutions – needing to provide applicable education and to increase enrollments
Professional Certification

- Defines the profession
- Assures quality
- Sets a standard of competency
- Identifies qualified individuals
- Ensures continued expertise
- Improves marketability

URISA Certification Committee

- Established in 1998 by the Board of Directors
- 37 members with backgrounds in academic, public and private sector
- William Huxhold is committee chairman from the University of Wisconsin-Milwaukee
- Other GIS Professional organizations have been invited to participate in the program’s development
  - ASPRS
  - GITA
  - AAG
**URISA Certification Committee**

- Considered 100’s of ideas
- Numerous methods to certify people
- Testing vs. Achievement based
- Met over a period of 5 years

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**Certification, Registration, or Licensure?**

- **Architects** are CERTIFIED
  ... and so are Lunatics

- **Surveyors** are LICENSED
  ... and so are Dogs

- **Engineers** are REGISTERED
  ... and so are Sex Offenders
Certification or Licensure?

**Licensure:**
- Protect the public
- Supported by governmental legislation

**Certification:**
- Professional & Ethical standards
- Self-regulated by the profession

Benefits of Certification

**Ensure competency** among those who produce geographic information

Assist prospective employers to **identify competent applicants**

Define and protect a professional **body of knowledge**

Establish and maintain **links to GIS educational bodies**
Benefits of Certification

Recognition by one’s colleagues and peers that an individual has demonstrated professional competence and integrity in the field.

Establishment and maintenance of high standards of professional practice and ethical conduct.

Provision of a basis for judging the validity of allegations or complaints involving GIS practitioners.

Encouragement for established and aspiring GIS professionals toward continued professional development and advancement.

Who Else Gains?

• The Public
  – Assures tax dollars well spent
  – Improves quality of life

• Young People
  – Awareness of the profession as a career
  – Assist with educational choices
GIS Professional Certification Proposal

Guiding Principles

- Must be voluntary and open to all
- Must be flexible
- Must use existing GIS educational bodies
- Must be collaborative
- Must include a code of ethics
Principles

1: Any initiative must be voluntary
   – Minimize barriers to entry and employment
   – Open to all qualified individuals

2: Any initiative must be flexible.
   – Forward looking to accommodate rapid change in the profession
   – Entry should be a combination of education, experience, and professional contribution

Principles (cont.)

3: Any initiative should incorporate existing GIS educational infrastructure
   – Leverage already established GIS courses in order to minimize testing
   – Use a point system for collecting credits where different activities have different values toward certification

4: Any initiative should be collaborative
   – Consider the contributions of all GIS-related disciplines
   – Consider the needs of employers
   – Consider the needs of community colleges
   – Consider a non-hierarchical structure of competence areas
Professional Experience Portfolio

Point-based Self Documentation
Achievement points that are derived from three categories:

- Educational Attainment
- Professional Experience
- Contributions to the GIS Profession

There is no test!

Minimum Requirements Benchmark

- **EDUCATION** – Bachelor’s degree with some GIS courses (or equivalent)
- **EXPERIENCE** – Four years in GIS application or data development (or equivalent)
- **CONTRIBUTIONS** – Membership and modest participation in a GIS professional association (or equivalent) … a modest record of participating in GIS conferences, publications, or GIS-related events (such as GIS-Day)
**GIS Certification Point Requirements**

- Education: 30 points
- Experience: 60 points
- Contributions: 8 points
- Additional: 52 points
- TOTAL 150 Points

See Full Details at:

www.GISCI.org or
www.URISA.org/certification

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**GIS Certification Process**

Portfolios will be submitted to an independent review board for final approval

A minimum number of points in each of the three categories is required

A letter of authenticity from one’s employer and transcript documentation is required
Supporting Documentation

- The other component of the GISCI application is the supporting materials that need to be provided.
- These Include:
  - Official university transcript(s)
  - Current résumé
  - Letter from an immediate supervisor
  - Adequate and acceptable documentation of the contribution points. (receipts, ISBN #’s, copies of articles, etc.)

Educational Attainment

A formal education does not ensure GIS qualifications, but does develop:

- **Intellectual maturity** to approach problems systematically and critically, and
- **Communication skills** for articulating capabilities, benefits, and limitations of GIS

(Those without a formal education can substitute with courses, conferences, etc.)
## Educational Attainment

### Credential Points:

- **Master’s** 25 pts
- **Bachelor’s** 20 pts
- **Associate’s** 10 pts
- **GIS Certificate** 5 pts
  
  *400 or more student activity hrs

Select the highest earned

### Course Points:

- Geospatial technology courses and related courses taken

1 point for every 40 student activity hours

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### EDUCATION POINT SCHEDULE SHEET (EDU-1)

**Note:** fields are courses that may be counted even if they were completed as part of a degree or certificate program for which the applicant has also claimed Credential Points.

**Credential Points:**

1. Enter highest credential earned or a Doctorate degree or equivalent (attach documentation)
2. Enter point value of highest credential earned
3. In the case of multiple degrees, credential points are earned for the highest degree only. Other degrees may also be counted.

<table>
<thead>
<tr>
<th>Credential</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctorate Degree (Ph.D.)</td>
<td>27 pts</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>20 pts</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>15 pts</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>10 pts</td>
</tr>
<tr>
<td>GIS Certificate</td>
<td>5 pts</td>
</tr>
</tbody>
</table>

**Total Credential Points:**

**Course Points:**

1. List title of courses (attach documentation)
2. Calculated Student Activity Hours per point
3. Sum of Student Activity Hours
4. Convert Student Activity Hours to Course Points (hours/40 hour per point)

<table>
<thead>
<tr>
<th>Relevant course(s), (If necessary use Sheet EDU-2 for more space)</th>
<th>Student Activity Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Student Activity Hours:**

40 hrs per point

**Total SAH from EDU-1:**

**Total SAH from EDU-2:**

**Total Course Points:**

**TOTAL EDUCATION POINTS (Credential Points + Course Points):**
Professional Experience

Job experience is the most important factor in GIS qualifications because:
• Performing in a job provides learning experiences that allow growth and expansion of skill sets
• Work environment with other professionals allows transfer of knowledge

Professional Experience

• Data analysis, system design, programming, or similar position 25 pts/yr
• Data compilation, teaching, or similar position 15 pts/yr
• GIS user position 10 pts/yr
Plus…..
• BONUS points for management 10 pts/yr
**Contributions to the Profession**

Documents and activities that add to the professional body of knowledge for the **benefit of the profession** as a whole – not just the employer and client.

<table>
<thead>
<tr>
<th>Points for years in a GIS position of data analysis, system design, programming, or similar GIS position.</th>
<th>Points for years in a GIS position of data compilation, teaching, or similar position.</th>
<th>Points for years in a GIS user position</th>
<th><em>Bonus</em> points for years in a GIS supervisory or mgmt. position (<em>points are additive to the other three positions)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>[Table Body]</td>
<td>[Table Body]</td>
<td>[Table Body]</td>
<td>[Table Body]</td>
</tr>
</tbody>
</table>

TOTAL EXPERIENCE POINTS (Sum of the four above) = _______ points
Contributions to the Profession

- GIS publications
- Involvement in GIS professional groups
- Participation in GIS conferences
- Awards for GIS work or contribution
- Other contributions

CONTRIBUTIONS POINT SHEET (CON-I)

<table>
<thead>
<tr>
<th>GIS Publications</th>
<th>Formula</th>
<th>Points Earned</th>
<th>Documentation Provided? Y or N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book author/editor</td>
<td># of books times 15 pts per book</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Published atlas (as author)</td>
<td># of atlases times 15 pts per atlas</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Refereed paper</td>
<td># of papers times 5 pts per paper</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Published map (as author)</td>
<td># of maps times 5 pts per map</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Editorial Board</td>
<td># of years times 3 pt per year</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Article</td>
<td># of articles times 3 pts per article</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Paper in conference proceedings</td>
<td># of papers times 2 pts per paper</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Newsletter Article</td>
<td># of articles times 1pt per article</td>
<td>=</td>
<td>=</td>
</tr>
</tbody>
</table>

Note: Professional writing is credited as Experience. Publication of theses and dissertations is credited as Education.
### GIS Professional Association Involvement:

<table>
<thead>
<tr>
<th>Level of Involvement</th>
<th>Formula</th>
<th>Points Earned</th>
<th>Docum. Provided Y or N?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presidency</td>
<td># of terms times 5 pts per term =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board membership</td>
<td># of terms times 4 pts per term =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Committee chairmanship</td>
<td># of terms times 3 pts per term =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Committee participation</td>
<td># of terms times 2 pts per term =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Association membership</td>
<td># of terms times 1 pt per term =</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other GIS Contributions:

<table>
<thead>
<tr>
<th>Type:</th>
<th>Formula</th>
<th>Points Earned</th>
<th>Docum. Provided Y or N?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event organization (1)</td>
<td># of events times 2 pts =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event participation (1)</td>
<td># of events times 1 pt =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Related community Contributions (2)</td>
<td># of events times 1-3 pts (variable) =</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Contributions Points (Sum the above points) = ________ points
**Additional Requirements**

- **Code of Ethics**
- **Renewal**
  - Every five years
  - Minimum points in each category and total
Signing the Code of Ethics

- The last step for all accepted candidates is to digitally sign the GISCI Code of Ethics.
- This is mandatory and must be completed within 90 days of acceptance.
- After this is completed the applicant’s status is switched from “tentative” to “active”.

Implementation Administration

- GIS Certification Institute – GISCI
- Established as an independent non-profit professional association – 501 c 3
- Administered by URISA under a 5-year contract
Establishing GISCI

- Why not URISA and why GISCI?
  - Legal and financial protection for URISA and its members and officers.
  - Ability to expand the Institute to make it more multilateral when the time comes.
  - Wanted to enforce the principal that certification has no membership requirement.

What is GISCI?

- GISCI is the GIS Certification Institute
- It is a 501(c)(6) organization – Similar to a trade association
- Will provide the GIS industry with a complete mechanism for certification
- At its inception, will not offer any other programs or champion other initiatives.
- In the eyes of the law and the IRS it is a completely separate organization from URISA.
The Mission of GISCI

To maintain the high standards and integrity of the GIS profession and promote ethical conduct within it.

The Administrative Structure of GISCI

- GISCI will be governed by a Board of Directors.
- URISA will handle the day to day operations and will assess GISCI a management fee.
- It is the goal that GISCI will become financially solvent and be able to hire full-time staff.
The Board of Directors

- According to the GISCI bylaws, the Institute currently has only one “member” – URISA.
- This is expected to change as the program grows.
- The by-laws were drafted for multilateral participation.
- GIS related Associations/Organizations may join at the discretion of the existing members.

Submitting the GISCI Application

- Applications must be complete and all items need to be included as specified.
- Full payment must accompany the portfolio.
- There is a quarterly submission cycle:
  - January 1
  - April 1
  - July 1
  - October 1
- Mark the first day of each quarter that applications will be accepted.
The Application Review Process

- The GISCI Staff performs a QUANITATIVE review.

- The GISCI Review Board performs a QUALITATIVE review.

GISCI Staff Review

- Will determine if the points have been added and documented correctly.
- Will make a recommendation of the applicant’s status to the Review Committee.
  - Accepted Outright
  - Rejected Outright
  - Pending Further Review
GISCI Review Committee

• 5 Volunteers with GIS backgrounds and credentials.
• Chosen by the GISCI Board of Directors
• Will make the final determination on ALL manners of points, documentation, and status.
• Their decisions are final and settled by simple majority.

GISCI Review Committee

• The committee will see and approve the scores for every GISCI applicant.
• They will perform independent reviews and return their decisions to GISCI staff.
• They will make periodic recommendations on how to improve the program to the BOD and Oversight Committee.
Notifying the Applicants

• All accepted/rejected candidates will be notified of their status as the end of the quarter.
• Accepted candidates will receive a congratulatory letter and a certificate.
• Rejected candidates will be encouraged to resubmit.

Next Steps

• Code of Ethics
• Pilot program – State of Georgia
• Critiques and Adjustments
• Implementation

EXPLORE and FEEDBACK your comments
www.GISCI.org or
www.URISA.org/certification
The Pilot Program

- GISCI received 60 completed applications as part of the Pilot Program.
- 85% of the applicants said that the process and program were clearly understood.
- 85% also said that the application process took them between 1 and 4 weeks to complete.
- The average age of Pilot Program Participants was roughly 36 years of age. 2/3 of the participants (68%) were male.

Pilot Program

- Two, 5-person teams comprised of members of the URISA Certification Committee are in the process of reviewing applications.
- The lessons learned will be incorporated into the new program when the general Committee reconvenes this summer.
- Successful Pilot Program participants will NOT be considered certified by GISCI.
- The Final Program should be available by October 2003.
Pilot Program

• The cost of the program is still being determined and will be set at the conclusion of the Pilot Program.
• Early estimates set the fee around $250 which will cover the application review process and 5 years of GISCI “membership”.
• Grandfathering will also be examined this summer by the committee to help those who predate existing GIS certificate programs and jobs.
• If you are interested in learning more about the GISCI Pilot Program please contact Certification Manager Scott Grams at sgrams@urisa.org.

Thanks – Any Questions?
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