
Getting started as a GIS professional

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Outline

- What does it mean to be a GIS professional?
- What does it take to become a GIS professional?

"Passion"

Training

Is GIS a profession?

Experience

Professionalism

Certification

Attributes of a profession*

- A mission
- A formal organization
- A common language
- Culture and lore
- Specialized training
- A specialized body of knowledge
- Code of ethics
- Licensing or certification

*from D.L. Pugh, 1989

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Definitions

- Certification
 - candidate meets a specified set of criteria defined by a certification board
- Qualification
 - usually a degree obtained by following a formal university course of study
- Licensure
 - regulated by legislation, intended to protect public health, safety and welfare
- Accreditation
 - evaluation of education programs

Why certification?

- Is this person qualified to do the job?
- How to compare one person's qualifications with another?
- How to compare certificates offered by different institutions?
- How to compare qualifications across international boundaries?
- Need to define the profession so that some sectors do not take control.

Who benefits from certification? (1)

- Practitioners
 - esp. professionals who do not have a university degree in a relevant discipline
 - demonstrates that knowledge and skills have been attained
 - may increase salary
- Employers
 - assessment of applicant's qualifications
 - identifies basic skills needed for a job

Who benefits from certification? (2)

- Educators
 - defines appropriate contents for education programs
- Students
 - provides guidance on the knowledge and skills needed
 - helps in evaluation of various education sources

Why NOT certification?

- no clear definition of the profession
- no clear understanding of the necessary skills and knowledge
- control of the profession may be assigned to a single organization
- potential to limit growth of the field, exclude qualified people
- impacts academic freedom.

Challenges

- a multidisciplinary, multi-level profession
- defining the necessary competencies
- assessing competencies
- managing the necessary infrastructure

Certification Activities/Programs

- ISO TC 211, Project 19122
- GIS Certification Institute (US-based)
- Spatial Information Sciences Institute (Australia)

ISO TC 211, Project 19122

- ISO
 - International Organization for Standardization
- TC 211
 - Technical Committee on Geographic Information/Geomatics
- Project 19122
 - Qualification and certification of Personnel

Defining professionals - ISO TC 211

- Project 19122 to prepare a report
 - to describe a system for qualification and certification,
 - by a central independent body,
 - of personnel in the field of GI/Geomatics
- Original proposal by Canada in 1998
 - motivated by agencies funding foreign contracts

ISO TC 211, Project 19122

- Survey of certification/qualification systems
 - Incomplete coverage, mostly completed by members of the surveying community
- Case studies of national education systems and certification opportunities for GI/Geomatics, included sections on:
 - Terminology
 - Professional associations
 - Current qualifications and certification initiatives
 - Future directions

National Case Studies

- Australia
- Austria
- Canada
- China*
- Finland
- Germany
- Japan
- Korea
- New Zealand*
- Portugal
- Saudi Arabia
- South Africa
- United Kingdom
- United States

*withdrawn or incomplete

Certification/Qualification models

- Competency guidelines
- Qualification through education
 - University degrees
 - National Vocational Qualification, e.g. Australia, South Africa
- Exams
 - National exam body, e.g. Korea, Japan
 - National exam through education institution, e.g. Germany

Implementation models (cont)

- Competency guidelines
- Qualification through education
- Exams
- Professional certification, e.g. Canada, US, Australia
- Individual professional development, e.g. UK
- Mutual recognition, e.g. FIG
- International regulation, e.g. IHO

ISO TC 211, Project 19122

- Results
 - Produced a "white paper" on our research
 - Recommended that ISO *not* take the lead on certification
 - Should be advanced by a broadly based international professional organization which
 - promotes the wide range of qualification and certification systems currently in place within individual countries
 - builds on this report's framework to identify similarities and differences between national and regional systems

GIS Certification Institute

- Project initiated in 1998 by URISA in the US
- Developed by a large committee with representation from many different GIS organizations and domains
 - lots of meetings over several years, lots of community input informed the final version
- Program formally started in January 2004
- Run by an independent certification organization,
GIS Certification Institute (GISCI)



Guiding Principles for GISCI Program

- 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

No Test!

- Point-based and self-documented
- Based on achievement in three categories:
 - Educational attainment
 - Professional experience
 - Contributions to the profession

Defining professionals - GISCI

- Certification based on total points
 - Education points
 - Minimum required is equivalent of an undergraduate degree
 - However, points can be obtained for GIS courses, workshops, seminars, conferences
 - Experience points
 - Equivalent of 4 years in GIS data analysis, system design or programming position
 - Contributions to the profession
 - Points given for publications, conference presentations, committee membership, awards, GIS Day, mentoring

GIS Certification Institute

- Program is very successful
 - After 13 months of operation (Feb '05), there were 634 GISPs (GIS Professionals)
- International applicants are encouraged to apply
 - www.gisci.org



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The GIS Code of Ethics

- Developed by Will Craig and the URISA Certification Committee
- Intended to
 - help professionals make appropriate and ethical choices
 - help preserve and enhance public trust in the discipline
- May be used to apply sanctions for unethical behavior

The GIS Code of Ethics

- Obligations to society
 - Do the Best Work Possible
 - Contribute to Community to Extent Possible
 - Speak Out About Issues
- Obligations to Employers and Funders
 - Deliver Quality Work
 - Have a Professional Relationship
 - Be Honest in Representations

The GIS Code of Ethics - cont

- Obligations to Colleagues and Profession
 - Respect the Work of Others
 - Contribute to the Discipline
- Obligations to Individuals
 - Respect Privacy
 - Respect Individuals.

Attributes of a profession*

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What do you need to know?

- NCGIA Core Curriculum 1990
 - List of fundamental topics formed the foundation for many early GIS university courses
- Australia, South Africa skills standards
 - Define vocational skills needed by workers in the GI industry
- NASA/USM Competency Model
 - Summarizes a comprehensive set of generic business skills rather than focusing on key GIS knowledge
- UCGIS Model Curricula
 - Seeking to define a GIS Body of Knowledge
- Textbooks reflect author's version .

US Department of Labor

- "Geospatial Technology" recognized as one for the three high growth employment areas
- "DOL is partnering with employers and education providers to develop and model skills training solutions nationally"

How do you learn?

- Training
- Practice
- Professional education
 - Defining a new level in the GIS career track
 - Building a critical part of the human infrastructure

Master of Science in GIS

Concentration in Geographic
Information and Analysis

University of Redlands
Redlands, CA

Program design



- Internationally oriented
- Intensive, one year, residential
- Combines science, technology and project management
- Concentration in geographic information and analysis
 - Program core is "geographic information"
 - Suitable for professionals and recent graduates from any field with some GIS experience

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Program goals

- Graduates enhance their existing academic foundations and experience with
 - comprehensive understanding of GI Science fundamentals
 - the use and application of GI technologies, and
 - experience managing group and individual projects
- Graduates prepared to be *GIS practitioners*
 - project managers
 - applications specialists
 - applications software development team members

Topic/ Months	GI Science	GI Technology	Project	Profes- sional Practice	Electives
1-2	Fundamentals of Geographic Information	Introduction to GI Technology	Project scoping	UR/ESRI Colloquium GIS Software Training Special Workshops	Fundamentals of Remote Sensing GIS for the Web
3-4	Information Systems Foundations for GIS + Statistics for GIS	Creating and Managing Geodatabases	Project Analysis		
5-6	Spatial Analysis	Working with GIS	Project Proposal		
7-8	Programming for GIS		Project Design		
9-10	Communicating Geographic Information		Project Implement'n		
11-12			Completion and Closure		

Building the GIS professional

- Professionals are a critical part of the infrastructure for GIS projects and enterprises
- Professionals need more than technical training
- Professionals should take responsibility for maintaining and upgrading their skills and knowledge
- Professionals should recognize the code of ethics

Websites for more information

- www.institute.redlands.edu
 - [/msgis](http://www.institute.redlands.edu/msgis)
 - [/kemp/certification.html](http://www.institute.redlands.edu/kemp/certification.html)
 - [/kemp/certificates](http://www.institute.redlands.edu/kemp/certificates)
- www.qisci.org
- www.spatialsciences.org.au
- www.ucgis.org
- www.ncgia.ucsb.edu
- email: karen_kemp@redlands.edu

Thank you for your attention!

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