Results of a Survey to Rate GIScience Publication Outlets

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Abstract

A plenary discussion at AGILE 2010 on how to build a consensus quality rating for publication outlets with a declared Geographic Information Science emphasis led to the Association's backing of such an initiative. In 2012, a Delphi survey was undertaken to explore the issues and attempt to achieve consensus. While initially intended to be a Delphi Survey in which responses converge on consensus over a series of iterative rounds, a comparison of individual responses in Rounds 2 and 3 showed responses very stable with very little change in opinion as is normally expected, and intended, in the Delphi survey process. As a result, the final round should be considered a traditional survey which allows results to be assessed as majority values. We present these results, but they should not be considered as proposed ratings, only as reasonable estimates from the relatively small basis of responses we had. The last section of the report discusses these limitations and possible ways forward.

Keywords: publication outlet, rating scheme, performance evaluation, GIScience

1 Introduction

As reported in our paper prepared for the AGILE 2012 conference (Kemp et al., 2012), a plenary discussion at AGILE 2010 on how to build a consensus quality rating scheme for publication outlets with a declared Geographic Information Science emphasis led to the Association's backing of such an initiative. In 2012, an international survey of individuals identifying themselves as widely published Geographic Information Scientists was undertaken to explore this issue. This paper reports the results of that survey.

While intended to be a Delphi Survey, in which responses converge on consensus over a series of iterative rounds, a comparison of individual responses in Rounds 2 and 3 of our survey disclosed stable choices with very little change in opinion. Such change is normally expected, and intended, in the Delphi survey process in order to achieve consensus. Additionally, ratings for many of the individual outlets varied significantly among participants with no convergence on a final consensus. As a result, we conclude that the final round of this survey should be treated as a traditional survey only. This allows results to be evaluated as simple majority values.

2 Rating framework

The goal of the survey was not to rank outlets, only to rate them by very few categories (similar to credit ratings of countries or banks). It was pointed out by AGILE 2011 participants that any categories below a second tier are typically meaningless and ignored in comparable ratings. Thus, for the set of publication outlets with a declared focus on GIScience, we used three rating categories (A, B, C), where A implies "leading", and the difference between B and C is that of fulfilling (or not) the following formal quality assurance requirements:

- full paper submissions;
- at least two reviews per submission;
- internationally composed editorial board or program committee.

In the preliminary rounds an additional quality assurance criteria – sharing of all reviews and decisions with authors and reviewers – was included. However, since it is very hard to verify this criterion, we decided to eliminate it as an assessment measure in the final round.

Not fulfilling any of these three formal quality criteria places a publication outlet automatically in category C. Thus, B vs. C ratings are based on the quality of the review process, not on the quality of published papers. On the other hand, for a publication outlet to be rated "leading" (A), a commonly perceived track record of consistently publishing high quality papers is likely to be important.

3 Design of the survey

The survey was administered in three rounds:

- Round one (June–July 2012) – review the list of candidate Geographic Information Science publication outlets and extend it with additional candidate outlets

- Round two (September–October 2012) – provide individual ratings of all outlets considered to be Geographic Information Science
- Round three (December 2012-January 2013) – review collective ratings and consider revising personal scores in view of group consensus

The survey was carried out through a form-based web interface to a database, designed and hosted by the Institute for Geoinformatics at the University of Muenster. Participants were notified of the opening of each round and of the results of previous rounds, and they were reminded to complete rounds as required.

4 Participation summary

Participation in the survey was open to any researcher who has a PhD or equivalent degree and has published in at least five different journals with broad international readership. The survey was advertised widely in the European and US GIScience communities, with the hope that many outside these boundaries would also be notified. The total number of valid responses per round is shown in Table 1.

Table 1 – Number of participants per round

Round	Count
Round 1	79
Round 2	54
Round 3	56

Participation was not consistent between the rounds, and additional respondents were invited to participate at each stage. Table 2 summarizes the involvement of individual respondents.

Table 2- Inter-round participation rates

Rounds	Count
Round 1 only	33
Round 2 only	8
Round 3 only	8
Round 1+2	10
Round 1+3	12
Round 2+3	12
All rounds	24

Geographic distribution of all participants, regardless of round, is summarized in Table 3 and Table 4.

Table 3 – Participation by Continent

Continent	Count
ANZ	4
Asia	6
Europe	46
NA	62
SA	1

Table 4 – Participation by Country

Country	Count
Australia	3
Austria	3
Belgium	1
Brazil	1
Canada	13
China	2
France	6
Germany	13
Greece	1
Hong Kong	3
Italy	3
Japan	1
Netherlands	7
New Zealand	1
Portugal	2
Spain	1
Sweden	1
Switzerland	3
United Kingdom	5
United States	49

Professional attributes collected from our participants were difficult to constrain to a limited list of choices. However, some clear propensities emerged. Of the total 117 who participated once or more, 90 listed their degrees as PhD, 11 as Professor and 6 as Habilitation. In terms of academic rank, of the 117, at least 80 indicated they hold a tenured faculty position and 16 untenured. Other ranks stated include post-doctoral researcher (5), professor emeritus (4), geographer, chief scientist, and engineer.

The diversity of labels used by individuals is reflected in the range of academic disciplines to which each participant indicated affiliation. The top fields reported are shown in Table 5.

Table 5 – Participants by Discipline

Discipline	Count
Geography	49
Geoinformatics/Geomatics	12
Computer Science	11
Spatial Information Science	10
Geographic Information Systems	8
Planning	3
Others	24

5 Analysis of change between rounds

We cannot claim Delphi survey style consensus results due to the wide range of different rating responses in each round. This conclusion is borne out by an examination of the stability of individual responses between Rounds 2 and 3. While there is some change, there were only 91 changes across the 3600 individual ratings for which there are two rounds of responses. The number of changes per participant and per outlet are summarized in Table 6 and Table 7.

Table 6 – Number of changes per participant

# changes	# participants	Total changes
0	10	0
1	8	8
2	6	12
3	2	6
4	3	12
5	1	5
6	2	12
8	2	16
10	2	20
	total = 36	total = 91

Table 7 – Number of changes per outlet

# changes	# outlets	Total changes
0	51	0
1	22	22
2	17	34
3	6	18
4	3	12
5	1	5
	n = 100	total = 91

Table 8 summarizes the direction of changes. There is no apparent trend here, nor is there one in the set of changes for any single outlet. For example, one journal had the following set of individual changes (A to B, B to C, C to B and B to A). There were also several changes from blank or unknown to a rating, but these are not summarized here as that indicates a change in awareness rather than a change in opinion.

Table 8 – Analysis of inter-round changes

From Round 2	To Round 3 Not GISc	A	B	C
Not GISc			7	1
Leading (A)	4		27	
Not leading (B)	16	17		6
Not quality (C)	2	1	10	

6 Basis of our Analysis

Since there was significant variation in respondents' opinions in Round 3, we cannot conclude that we have reached a consensus in this survey. Therefore, we treat the results as those of a standard survey rather than a Delphi survey. This allows us to calculate totals and percentages of responses as the basis for our preliminary conclusions.

We calculated two values across the rows for each outlet:

- *TotalFamiliar* – this is the total of A, B, C and NotGISc counts for each outlet. This total removes responses from those who indicated they were not familiar with the outlet or left a blank. These are seen as non-responses with respect to the objective of rating outlets. Using this value allows us to determine, of those familiar with the outlet, what percentage rate it as NOT GIScience.
- *TotalRating* – this is the total count of votes over the three categories (A/B/C). This total is used to compare rating levels amongst only those respondents who indicated, by providing a rating, that they consider the outlet to have a focus on GIScience.

One can now adopt a minimum value of TotalFamiliar for a rating to be determined for any outlet.

To determine the ratings, one would then use rules like the following:

NOT GIScience focused outlet
- Any outlet for which there were 10 or more NOT GIScience responses and more than 50% of the TotalFamiliar count rated it as NOT GIScience, is assigned the NOT label.
- If there are less than 10 NOT GIScience responses, a question mark "?" is appended to indicate a weak majority.

A/B/C rating
- If an outlet is not rated as NOT GIScience, i.e. if it is considered to have a focus on GIScience,, a minimum of 10 responses in TotalRating is required for a rating to be determined.
- For each outlet that is considered GIScience focused, any category that received more than 50% of the TotalRating is assigned that rating.
- Where there are two ratings each receiving between 35 and 50%, the rating is combined (e.g. A/B) to indicate a tie.
- When less than 10 responses were provided in the majority category, a question mark "?" is appended

to the rating to indicate a weak majority. In the case of ties, the sum of the counts of both categories is subject to this rule.
- Where the count of NOT GIScience is more than the count of the majority rating, /NOT is appended.
- A "#" indicates unable to determine, usually one rating is just 50%, marginally under the threshold.

7 Results and discussion

The results computed based on the rules in section 6 are reported in the appendix. Our motivation to state them at all is the desire and obligation to share the outcome of this AGILE Initiative with the membership and with the GIScience community at large. We felt that, given the low numbers of "votes", it would also be better to only provide provisional ratings as derived from the stated rules, rather than detailed numbers on each outlet.

However, we hold major reservations against taking these results as more than an indication of current quality impressions among a minority of GI scientists. To some extent, they also indicate the state of community cohesion and of publication outlet awareness in the community. It would be against our intentions and against the spirit of a consensus-driven rating process if anybody referred to a publication outlet as "rated (A/B/C) by AGILE" or by the authors or making similar statements based on these tables. The results do not provide evidence of consensus, nor are they based on any solid theory of sampling, to warrant any such claims. Yet, we consider them informative and a useful basis for future quality assessment efforts.

8 Conclusions

The AGILE Initiative for a publication outlet rating was undertaken based on several observations about our field and the pressure its researchers face (for details, see Kemp et al., 2012). These motivating factors are still at least as strong as they were a few years ago, and the general awareness for quality- (rather than just quantity-) based assessments of researcher and lab productivity keeps rising. Given the justified skepticism against simplistic numerical measures, impact factors, and rankings, we had proposed a community rating process that is simple enough to agree, carry out, and maintain.

8.1 Obstacles

We believe that these overall goals remain valid. Yet, we also found some substantial obstacles in this first attempt to achieve them. In conclusion, and in preparation for discussions at AGILE 2013 and beyond, we present our view of the three main obstacles encountered.

1. Low degree of community cohesion: Putting a boundary around our field in order to determine what outlets have a focus within it (and should therefore be rated), turned out to be much harder than expected. The responses show that even some outlets from areas that clearly study geographic information (such as geodesy, geomatics, planning, or remote sensing) were placed outside GIScience. It is unclear what the value (to GIScience) of such exclusions is, but it clearly reduced

the number of outlets to be rated (which may be a good thing) and the basis for rating those considered to be focused on GIScience (which was a problem). In any case, delimiting the field was a first aspect where consensus could not be reached - which in itself is also not necessarily a negative result. The problem was rather that we did not plan for this issue to require (and fail) its own consensus process.

2. Wide topical range of outlets: No doubt as a consequence of the weak community cohesion, respondents often did not feel familiar enough with outlets to rate them, as their topical and cultural spread is wide. This has further reduced the number of "votes" received.

3. Lack of convergence: Delphi surveys are more than opinion polls – they are meant to change some opinions in order to reach consensus. The plan was to move to consensus in the third round, based on round two results. For various reasons (some explained above), no such convergence can be observed, or at least there is an equal amount of divergence. Maybe a further survey round would improve this situation, though the evidence that this is about to happen is not there. It could well be that we overestimated the readiness of academics to reach consensus on outlet quality, or the clarity and suitability of the proposed categories.

8.2 Possible ways forward

In view of the obstacles identified and the data presented, a number of options for how to move forward should now be discussed. We are optimistic that from the AGILE 2013 plenary and from further discussions among AGILE members or the GIScience community at large, additional ideas will emerge. Therefore, we refrain from voicing a preference among the options stated at this point.
- A. *Continue the Delphi process with one or more additional rounds*: This option is based on the hope that some more consensus can be achieved on the ratings, possibly also on what outlets to include.
- B. *Find a better method for reaching consensus*: if the rating could be based on measurable criteria (citations? average time to publish? others from the scientometric literature), consensus would only need to be reached on these criteria, not on each outlet.
- C. *Accept the results as what can be achieved for now*: This may imply to declare the project closed, with some interesting lessons learned.

8.3 Final thoughts

The past three years have been very interesting for us as those who initiated and conducted the study. Even if we are not able to declare a rating scheme now, much less a process to maintain it, we find the results in many ways informative and a good basis for further work. In hindsight, as indicated in 8.1, we could have probably improved the outcome here and there through more farsighted planning. However, on the whole, we have also received more skeptical than supportive comments regarding the feasibility or even desirability of the project. These comments appeared mostly behind the scenes and were always gently padded (at least by the

time they reached us). If the Delphi survey and this report help opening up the discussion on what this field wants to consider suitable quality criteria for its published research, we are more than happy with what has been achieved.

Acknowledgments

Reference

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Appendix: Provisional Ratings estimated from Round 3 of Delphi Survey

Journals

Outlet Name	Rating
CaGIS (Cartography and Geographic Information Science)	A
Computers and Geosciences	A
Environment and Planning B: Planning and Design	A
JoSIS (Journal of Spatial Information Science)	A
GeoInformatica	A
Geographical Analysis	A
TGIS (Transactions in GIS)	A
Computers, Environment and Urban Systems	A
International Journal of Remote Sensing	A
ISPRS Journal of Photogrammetry and Remote Sensing	A
Remote Sensing of Environment	A
IJGIS (International Journal of Geographical Information Science)	A
IJDE (International Journal of Digital Earth)	A/B
Journal of Geographical Systems	A/B
PE&RS (Photogrammetric Engineering and Remote Sensing)	A/B
IEEE Transactions on Geoscience and Remote Sensing	A/B
SCC (Spatial Cognition & Computation)	A/B
Geomatica	B
IJG (International Journal of Geoinformatics)	B
JGIS (Journal of Geographic Information System)	B
GIScience and Remote Sensing	B
Revue Internationale de Géomatique (International Journal of Geomatics and Spatial Analysis)	B
URISA Journal	B

Outlet Name	Rating
Journal of Spatial Science	B
Journal of Location Based Services	B
Computational Geosciences	B
International Journal of Applied Earth Observation and Geoinformation	B
Cartographic Perspectives	B
Canadian Journal of Remote Sensing	B
IJSDIR (International Journal of Spatial Data Infrastructures Research)	B
Cartographic Journal	B
Spatial Statistics	B
Cartographica (The International Journal for Geographic Information and Geovisualization)	B
Earth Science Informatics	B
Geo-Spatial Information Science	B/C
IJAGR (International Journal of Applied Geospatial Research)	B/C
Geographical and Environmental Modeling	B
Annals of the Association of American Geographers	B/NOT
International Journal of Health Geographics	B/NOT
Cybergeo (European Journal of Geography)	B?
Journal of Maps	B?
Acta Cartographica	B?
Applied Geomatics	B?
Geocarto International	B?
IEEE Geoscience and remote sensing letters	B?
Environmental Modelling & Software	B?

Outlet Name	Rating
Annals of GIS (Journal of The International Association of Chinese Professionals in Geographic Information Sciences)	C
gis.SCIENCE. Zeitschrift fur Geoinformatik	C?
Kartographische Nachrichten	C?
Journal of Remote Sensing and GIS	C?
GPS Solutions	C?/NOT
JGPS (Journal of Global Positioning Systems)	NOT
Professional Geographer	NOT
Applied Geography	NOT
GeoJournal	NOT
Journal of Applied Geodesy	NOT
Ecological Informatics	NOT
Environment and Planning A	NOT
Earth Surface Processes and Landforms	NOT
Remote Sensing Letters	NOT
Annals of Regional Science	NOT
Landscape Ecology	NOT
Geomatics, Natural Hazards and Risk	NOT
Marine Geodesy	NOT
Geografiska Annaler B	NOT
Geografiska Annaler A	NOT
Journal of Earth Science and Engineering	NOT
Stochastic Environmental Research and Risk Assessment	NOT
Survey Review	NOT
Geomorphology	NOT
Ocean and Coastal Management	NOT
Nordic Journal of Surveying and Real Estate Research	NOT
Journal of Navigation	NOT
Journal of Geodesy	NOT

Outlet Name	Rating
Journal of Coastal Conservation: Planning and Management	NOT
Journal of Arid Environments	NOT
Forest Eology and Management	NOT
Ecological Modelling	NOT
Proceedings of the National Academy of Sciences	NOT
Landscape and Urban Planning	NOT
Journal of Regional Science	NOT
Papers in Regional Science	NOT
Geoderma	NOT
Journal of Applied Remote Sensing	NOT?
Solstice: An Electronic Journal of Geography and Mathematics	NOT?
Mathematical Geosciences	NOT?
Journal of the Indian Society of Remote Sensing	-
Geography Compass	-
International Journal of 3D Information Modelling	-
International Journal of Agricultural and Environmental Informations Systems	-
e-Perimetron	-

Conference Proceedings

Outlet Name	Rating
GIScience (International Conference on Geographic Information Science)	A
ACM SIGSPATIAL GIS (ACM International Workshop on Advances in Geographic Information Systems)	A
COSIT (Conference On Spatial Information Theory)	A
SDH [EARLY YEARS] (International Symposium on Spatial Data Handling)	A
SSTD (International Symposium on Spatial and Temporal Databases)	A/B
ISSDQ (International Symposium on Spatial Data Quality)	A/B
SDH [RECENT YEARS] (International Symposium on Spatial Data Handling)	A/C
AGILE (Conference of the Association of Geographic Information Laboratories for Europe)	B
AutoCarto [EARLY YEARS] (International Symposium on Automated Cartography)	B
SeCoGIS (International Workshop on Semantic and Conceptual Issues in GIS)	B
Geoinformatik / Geoinformatics	B/C
AutoCarto [RECENT YEARS] (International Symposium on Automated Cartography)	B?
Geosensor Networks (International Conference on Geosensor Networks)	B?
AGIT (Angewandte Geoinformatik)	C
GSDI (Conference on Global Spatial Data Infrastructures)	C
GeoInfo Brazil (Brazilian Symposium on GeoInformatics)	C?
VLDB (International Conference on Very Large Databases)	NOT
ACM SIGMOD/PODS (International Conference on Management of Data)	NOT
ICDE (International Conference on Data Engineering)	NOT
GeoS (International Conference on Geospatial Semantics)	#
ICC (International Cartographic Conference)	#

Outlet Name	Rating
Accuracy (International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences)	#
GI-Forum (Symposium and Exhibit on GIScience and Technology and Learning with GI)	-
CUPUM (Computers in Urban Planning and Urban Management)	-
GEOBIA (Geographic Object-Based Image Analysis)	-
W2GIS (Symposium on Web and Wireless Geographical Information Systems)	-
3D GeoInfo Conference	-
SAGEO (Spatial Analysis and GEOmatics)	-
CoastGIS	-