



Fellows Program Review Task Force Report



Findings and Recommendations for
Union Fellows Program and Process Improvements

November 2014



The AGU Fellows Class of 2011

“AGU members should know that the Fellows Committee is a wonderful committee on which to serve. Most of the hard work involves reading the nomination packages of 70 or so [up to 106 in 2014] uncommonly interesting people and electing about half of them as Fellows. The Committee is confident that their election brought considerable joy to those elected, as well as to their parents and spouses, nominators and supporters, and superiors and colleagues. All in all, the Fellows Committee brought a lot of happiness to hundreds, perhaps a thousand people around the world with a single morning’s work [now 2 days], and that’s getting hard to do these days. Moreover, the Committee is equally confident that the mistakes it makes, mostly forced upon it by the 0.1%-of-the-membership rule, are always correctable in years to come.”

— Thomas C. Hanks, Chair, Fellows Committee, 1996-98
Eos, Vol. 78, No. 30, July 29, 1997

CONTENTS

1. INTRODUCTION: A MESSAGE FROM THE TASK FORCE CHAIR.....	4
2. TASK FORCE ROSTER.....	5
3. EXECUTIVE SUMMARY.....	6
4. THE AGU FELLOWS NOMINATION PROCESS AND DIVERSITY PERFORMANCE.....	8
5. SECTION AND FOCUS GROUP PRACTICES.....	16
6. THE AGU FELLOWS SELECTION AND ALLOCATION PROCESS.....	20
7. LIMITATIONS OF THE H-INDEX.....	24
8. HOLD-OVER NOMINATIONS.....	28
9. OPPORTUNITIES FOR ENGAGEMENT.....	31
10. APPENDICES	
A. TASK FORCE CHARGE.....	35
B. FELLOWS NOMINATION GUIDELINES AND ANNUAL PROCESS TIMELINE.....	36
C. LIST OF TABLES AND FIGURES.....	39
D. SUPPLEMENTAL TABLES AND FIGURES.....	40
E. REFERENCES.....	41

INTRODUCTION: A MESSAGE FROM THE TASK FORCE CHAIR

Election as an AGU Fellow is viewed by many scientists across the organization as one of the most coveted honors bestowed by the Union for scientific recognition. Less than one tenth of one percent (0.1%) of AGU members are selected to receive this honor each year.¹

In recent years, AGU has adopted new governance policies and membership demographics have become more diverse. Several questions have been raised concerning various aspects of the Fellows selection process, including its overall performance in recognizing diverse candidates from underrepresented populations, including women, minorities, non-U.S., and interdisciplinary members. For these reasons, AGU commissioned a Task Force charged with investigating these questions and recommending improvements to the current Union Fellows program.

In response to the Task Force charge, a committee of 16 well-respected scientists of Fellows and non-Fellows² — carefully selected to represent broad diversity — performed extensive data-gathering and deliberated over several meetings in a one-year period to deliver this report's findings and recommendations for improvement to the overall AGU Fellows nomination and selection process. At the outset, the Task Force members agreed that our primary mandate for this work was to assure fairness and transparency in the Fellows selection process while retaining the prestige of the Union Fellow award.

I have been proud to lead the effort of this program review with my extraordinary AGU scientist colleagues. The Task Force members and I believe that the findings and recommendations presented in this report will help position the AGU Fellows program for continued success, diversity, and prestige many years into the future.



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Task Force Chair

¹ A profile of the Union Fellows selection process is provided in Text Box 1, p. 9.

² The Task Force charge is included in Appendix A, p. 35.

FELLOWS PROGRAM REVIEW TASK FORCE ROSTER

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EXECUTIVE SUMMARY

The AGU Fellows Program Review Task Force, a committee of 16 scientists appointed by the AGU President, has completed a review of the AGU Fellows program, examining operational data and results. The year-long investigation by this Task Force has resulted in a series of 9 findings and recommendations for improving the fairness and transparency of the overall Fellows program operations while retaining its prestige. The 9 findings and recommendations presented and discussed in this report address the Fellows nomination and allocation processes; selection criteria; diversity performance in selecting Fellows; use of the h-index; hold-over nominations; and opportunities for increased engagement with AGU Fellows.

The most significant of the Task Force recommendations are summarized below:

- **Communicate Best Practices:** The Task Force recommends the AGU Honors and Recognition (H&R) Committee aggressively communicate best practices and guidelines for encouraging and supporting more diverse Fellows nominations. These best practices include: establishing canvassing committees, promoting diversity in ranking and selection committee membership, training committees on implicit bias, and capturing institutional memory from past-leaders of ranking and selection committees.
- **Revise Fellows Selection Criteria:** The Task Force recommends AGU update and revise its criteria for AGU Fellows selection to more explicitly recognize a home for scientists working in emerging inter-, trans-, or cross-disciplinary scientific areas, and to remove current wording such as “paradigm shift.” Suggested revised wording is provided.
- **Track and Report Diversity Performance:**³ AGU should continue to collect data on diversity performance and distribute it to members of canvassing and ranking committees. Transparency would be increased by publishing in *Eos* each year: “In the pursuit of excellence, here are the data on AGU Fellows...”
- **Provide Explicit Instruction and Caution on the Use of H-Index:** The Task Force recommends the h-index no longer be required as part of a nomination package. Guidelines for nominations should include that when the h-index is used, it is meant to be compared only within the same scientific discipline. When used in a nomination package or mentioned in letters, it should be incumbent on the writer to include the source of the h-index and a URL that has been uniquely identified for the candidate’s h-index calculation.
- **Adopt a Consistent Policy of No Hold-Over Nominations:** The Task Force recommends AGU adopt a consistent practice of no hold-over nominations for the Union

³ The Task Force used a working definition of “diversity” as the inclusion of underrepresented populations, such as women, minorities, non-U.S., and interdisciplinary members of AGU. A more exact definition of diversity used by the National Science Foundation, and as it applies to Federal Science and Engineering workforce in the U.S. is found at: <http://www.nsf.gov/statistics/infbrief/nsf11303/>. For data presented and discussed in this report, however, “underrepresented” is used to encompass women and non-U.S. members. Unfortunately, there are very limited data on the traditionally underrepresented U.S. ethnic minorities in the AGU member database, since AGU did not historically collect this information.

Fellows Selection Committee. For nominees not elected to Fellow, Sections and Focus Groups should solicit updated nominations and provide feedback from the Union Fellows Selection Committee to the nominator.

- **Pursue an AGU “College of Fellows:”** The AGU H&R Committee should explore the concept of a College of Fellows, whose members could contribute to outreach, education, mentoring, shadowing, position statements, and development. Exploration of and support for such an effort may best be pursued through a separate task force appointed by the AGU President.
- **Continue Research on Diversity and Interdisciplinarity Representation and Possible Interventions:** Some recent trends — particularly the growing diversity of Earth and space scientists, AGU membership, and recipients of AGU honors and recognition — merit further study, and the impacts of implementing the recommendations of this report will also require follow-up study to evaluate their effectiveness. The Task Force recommends AGU continue to study and explore these issues further, perhaps as part of a follow-on effort to evaluate the effectiveness of the specific recommendations from this report that are adopted.

Each of these recommendations is based on one or more findings discussed in this report along with the associated background supporting data. The Task Force recommends pursuit and adoption of the above suggested AGU Union Fellows program improvements as soon as practical.

AGU FELLOWS NOMINATION PROCESS AND DIVERSITY PERFORMANCE

Background

The selection of AGU Fellows is viewed by this Task Force as one of the most important member-related processes in AGU operations. Recently, AGU has undergone a transformation in terms of its strategic goals and governance. In addition, its membership has grown more diverse with an increased percentage of women and non-U.S. members over time. Table 1 shows the percentage of non-U.S. members nearly doubled from 1975 to 2014, and has grown from 32% to 39% during the past 14 years. Since the year 2000, the percentage of women members has also grown from 15% to 22%. As part of the response to these changes in AGU membership demographics, as well as the growth of interdisciplinary science,⁴ the leadership of AGU considered it both timely and wise to review the performance and operations of the AGU Fellows program, as it is one of AGU's most important honors and recognition programs supporting its membership population.

Year	1975	2000	2005	2010	2014
Approximate Total AGU Membership	12,000	39,000	45,000	60,000	62,000
% Women Members	Unrecorded	15%	17%	20%	22%
% Non-U.S. Members	20%	32%	34%	39%	39%

The charter for the Fellows Review Task Force requested a complete review of the Fellows program with attention to whether it is operating maximally in terms of AGU's strategic goals. The Task Force was specifically asked to make recommendations for addressing perceived gaps in selection of interdisciplinary science candidates, women, and non-U.S. candidates, and/or candidates from other underrepresented groups⁵, while maintaining current Fellows prestige.

The Task Force met over a one-year period for data-gathering and to deliberate on findings and recommendations. Through this, the Task Force requested and received performance-related data for the Fellows program and operational results of the Fellows process from recent years. The first

⁴ For example, see *Facilitating Interdisciplinary Research*, 2004, National Academies Press, Washington, D.C.

step of the Task Force’s analysis — an examination of the Fellows nomination process and diversity performance — is explored in this initial section of this report (Section 4). The remaining sections and the report’s Appendices address Section and Focus Group Practices (Section 5), the AGU Fellows Selection Criteria and Allocation Process (Section 6), Limitations of the H-Index (Section 7), Hold-Over Nominations (Section 8), and Opportunities for Engagement (Section 9) and associated background data (Appendices).

Text Box 1: Overview of the AGU Fellows Process

- Members of Union Fellows Selection Committee are appointed by AGU Executive Committee for 2-year term.
- Members of Section and Focus Group Fellows ranking committees are appointed as per Section and Focus Group bylaws.
- Fellows nominations can be made by *any* AGU member in good standing during the nomination period (typically mid-January to mid-March) via website: <http://honors.agu.org/fellows/fellows-nomination-criteria/>.
- Each Section and Focus Group considers Fellows nominations of their Section or Focus Group members and interdisciplinary nominations.⁶
- Section and Focus Group ranking committees are allowed to put forward to Union Fellows Selection Committee a prescribed number of nominations based on their membership. Each Section and Focus Group ranking committee chair sends a ranked list to Union Fellows Selection Committee including rationale for rankings.
- The Union Fellows Selection Committee chooses Fellows based solely on selection criteria, with no consideration given to their Section or Focus Group affiliation.
- The number of AGU Fellows elected each year will not exceed 0.1% of the total AGU membership population.
- Feedback is provided to nominators of unsuccessful candidates based on the deliberations of the Union Fellows Selection Committee or Section and Focus Group ranking committees.

Fellows Nomination – How Is It Working?

A summary overview of the overall AGU Fellows selection process is provided in Text Box 1.⁷ The Task Force examined data to help answer the following four nomination-related questions using AGU member demographics (Table 2) as a reference point:

⁶ Nominators may select up to three Sections and Focus Groups, in addition to the nominee’s primary affiliation, to review their Fellows nomination package.

⁷ See Appendix B for a more detailed annual timeline and nomination guidelines. In addition to “elected” Fellows, AGU also has “conferred” Fellows. Any AGU medalist or Ambassador awardee who was not previously elected a Fellow is automatically accorded the honor as well. This usually occurs with Macelwane medalists, who are typically early career scientists; however, it is not limited to them. The work of this Task Force focuses exclusively on the elected Fellows process.

1. What has been the actual performance of the Fellows process in nominations of diverse (women and non-U.S.) candidates?
2. Are nominations made by AGU Fellows more successful than nominations by non-Fellows?
3. What is the performance comparison across AGU Sections and Focus Groups for nominating diverse (women and non-U.S.) candidates?
4. What are the best practices of Sections and Focus Groups that result in more diverse nominations?

Detailed demographic data regarding Fellows nominees and nominators were collected and reviewed to help address the above questions.

AGU Fellows Nomination Demographics

AGU's overall membership demographics for 2012 indicate that at least 22% of AGU members are women and 39% are listed as non-U.S. members. A further profile of 2012 AGU membership by age group is also available.⁸ These tables indicate 24% of women members are in the 45-64 age range and 29% of non-U.S. members are in this same age range compared with 31% for overall AGU. The average age of AGU Fellows when elected is 57.

Table 2. Overall AGU Member Demographics in 2012*

Gender	Percentage of AGU Membership
Men	65%
Women	22%
Unreported	13%
Geographic Region	Percentage of AGU Membership
United States & Territories	61%
Western Europe	17%
Western Pacific	13%
Canada	4%
Latin America & Caribbean	2%
Eastern Europe	1%
Southeast Asia	1%
North Africa & Middle East	1%
Central & South Africa	<1%
Age	Percentage of AGU Membership
Under 25	2%
25-34	19%
35-44	18%
45-54	17%
55-64	14%
65-74	7%
75+	3%
Unreported	20%

*2012 AGU demographic data grouped China and Japan as part of Western Pacific; AGU reporting changes for 2013-14 groups China and Japan with Southeast Asia.

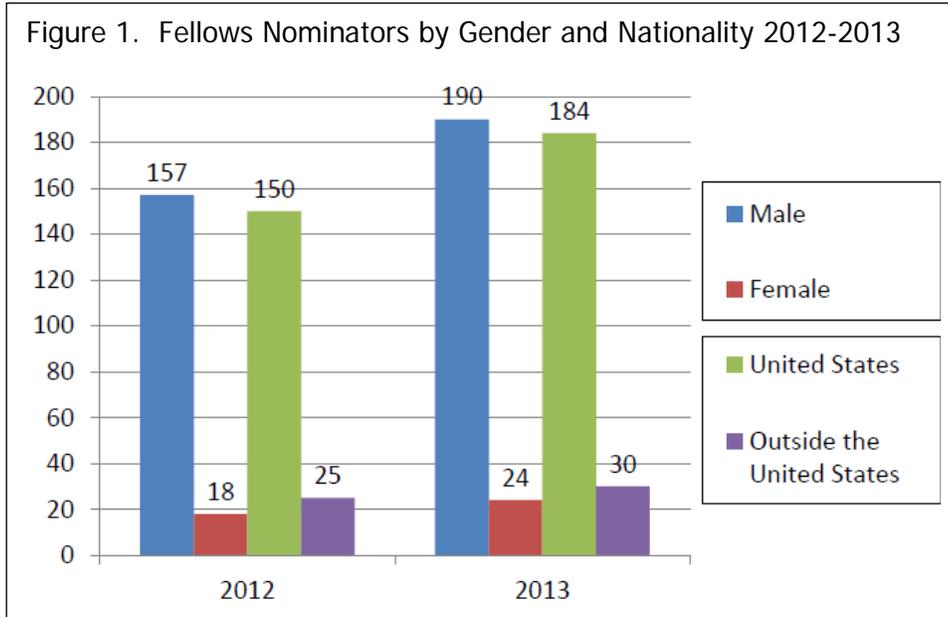
Table 3. Gender and Geographic Diversity of Nominees at Each Stage of the 2013 Fellows Process

	Initial Stage: Nominees		Second Stage: Section/Focus Group Ranked Nominees		Third Stage: Election of Fellows by the Union Fellows Selection Committee	
Men Nominees	172	(80%)	86	(83%)	49	(79%)
Women Nominees	42	(20%)	17	(17%)	13	(21%)
U.S. Nominees	166	(78%)	77	(75%)	49	(79%)
Non-U.S. Nominees	48	(22%)	26	(25%)	13	(21%)
Total	214		103		62	

⁸ Appendix D Figures D-1 and D-2, p. 40, show corresponding age demographics for women members and non-U.S. members.

Table 3 shows gender and geographic representation of candidates at each stage of the Fellows nomination process in 2013.⁹ These data indicate that 20% of nominations were for women candidates and 22% were for non-U.S. candidates both men and women.

Related to this, Figure 1 shows the 2013 demographic profile for nominators. For the 2012 and 2013 class of AGU Fellows, only 10% and 11% of nominations, respectively, were from women nominators; 14% of nominations were from non-U.S. members in each of these years.



To further address nomination demographics, Tables 4a and 4b compare the number and success rates for nominations made by AGU Fellows with nominations made by non-Fellows in 2012 and 2013. For the sample size examined, these data indicate an average of 27% of nominations come from non-Fellows and there is no obvious difference in success rates in 2012 with perhaps a small bias in 2013.

Tables 4a and 4b. Success Rate Profile for AGU Fellows Candidate Selection 2012-2013

2012			
	Nominated by non-Fellows	Nominated by Fellows	Total Nominations
Total Candidate Pool	47	128	175
Total Elected	17	44	61
Success Rate	36%	34%	35%
2013			
	Nominated by non-Fellows	Nominated by Fellows	Total Nominations
Total Candidate Pool	56	158	214
Total Elected	12	50	62
Success Rate	21%	32%	29%

⁹ Table 7, p. 16, provides additional demographic data on Fellows candidates by each Section and Focus Group.

Diversity Performance

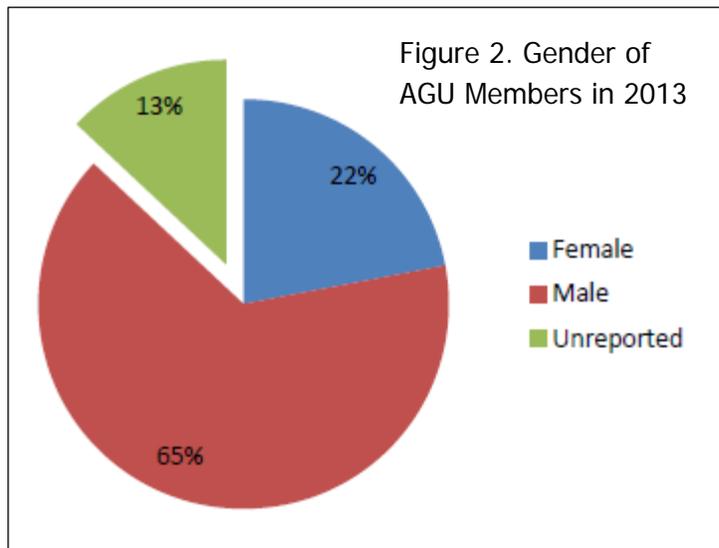
AGU became one of seven partner professional societies in a National Science Foundation (NSF) award to Association for Women in Science (AWIS) in 2009: Advancing Ways of Awarding Recognition in Disciplinary Societies.¹⁰ Representatives from AGU attended two workshops — in 2010 and 2013 — with representatives of the other partner societies to learn best practices for the honors and awards processes. Participant societies were asked to perform a self-assessment on their honors and recognition processes, including compiling data on the gender of their membership, of their honorees, and of the committees that select the honorees. AGU compiled these and additional data to examine whether the process of selection is fair; whether all members who are eligible for an award have a likely chance at receiving it.

AGU has since followed up with an examination of its honors and recognition processes through the creation of this Task Force. In the course of this work, the Task Force along with AGU staff collated data and carried out statistical analyses, and these data should be considered baseline data for future monitoring. The Honors and Recognition Committee also has access to these data.

Data Sources

AGU staff supplied demographic information for Fellows nominees from each Section and Focus Group, the nominees forwarded to the Union Fellows Committee, and the nominees ultimately selected to be Union Fellows. These data include name, gender, year of election to Fellow, year of birth, and country of residence. In addition, AGU staff supplied the Task Force with demographic data on AGU membership. Many AGU members have chosen not to supply their demographic information; the Task Force addresses this in the recommendations below. There are too many members with unknown demographic information to be certain that the processes of selection are unbiased (Figure 2). The Task Force used additional data from the National Science Foundation on the number of Ph.D.'s awarded to men and women by year in the Earth, Atmospheric, and Ocean Sciences (EAO)¹¹ to compare to the award recipient population.

The Task Force addressed two concerns: the possibility of gender bias and the possibility of nationality bias. The former was raised by data gathered by AWIS; the latter by a perception among some AGU members that there is a bias towards electing scientists from the United States.



¹⁰ NSF Award #HRD-0930073: http://www.nsf.gov/awardsearch/showAward?AWD_ID=0930073

¹¹ National Science Board. 2014. *Science and Engineering Indicators 2014*. Arlington VA: National Science Foundation (NSB 14-01).

Are Women Underrepresented Among the AGU Fellows?

To answer this question, the Task Force examined the proportion of women AGU members who are near the average age of Fellow election. Age is used because, aside from AGU’s Macelwane Medal recipients, it takes time to develop the body of work that is expected of an AGU Fellow and because fewer women received a Ph.D. in EAO in the past. Thus, current awardees should reflect past Ph.D. receipt data rather than current.

The Task Force found that the average age of newly elected AGU Fellows (from 2009 to 2013) is 57. The average age for women Fellows is 53; for Fellows who are men, it is 58. The potential pool for women who were about the right age to be elected Fellow between 2001 and 2011 would have received their Ph.D. approximately 20 years ago. We base this assumption on data from the National Science Board: between 1981 and 1991, the average age of a U.S. Ph.D. recipient in EAO was 33.¹²

Table 5. Proportion of AGU Fellows Who Are Women, 2009-2013¹³

	Women Fellows	Men Fellows	% Women Fellows	% U.S. Women Ph.D. Recipients in EAO 20 years prior*
2009	5	51	9%	20%
2010	8	53	13%	19%
2011	9	56	14%	21%
2012	5	60	8%	23%
2013	14	51	22%	20%

The proportion of EAO Ph.D. degrees to women between 1981 and 1991 rose from 8.5% to 22% and averaged 17%. The proportion of AGU Fellows that are women and were elected between 2009 and 2013 (years for which the Task Force was provided data) varied between 8% and 22% (Table 5) and averaged 13%. Based on this analysis, for four of the last five years, women have been underrepresented among AGU Fellows. However, in 2013 women were “over-represented.” The Task Force surmises that over-representation is a result of an effort including use of canvassing committees by some Sections and Focus Groups, as discussed below. Furthermore, over-representation may occur for several years as the deficit in prior years (i.e., overlooked women members) is addressed.

However, studies indicate that when attention to gender equity is distracted, women’s progress stalls.¹⁴ AGU should continue to monitor gender equity among its Fellows, and Sections and Focus Groups should implement best practices as described in this report to ensure a diverse pool of nominees. To best address gender equity, AGU needs more complete data on the gender of its members, as recommended below.

¹² National Science Board. 2014. *Science and Engineering Indicators 2014*. Arlington VA: National Science Foundation (NSB 14-01).

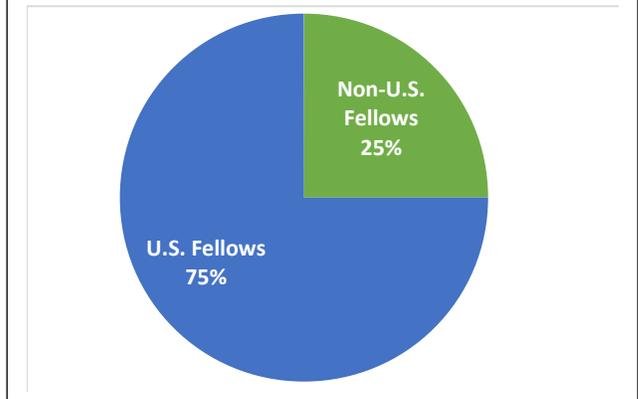
¹³ National Science Board. 2014. *Science and Engineering Indicators 2014*. Arlington VA: National Science Foundation (NSB 14-01).

¹⁴ Hopkins, N., 2006. Diversification of a university faculty: Observations on hiring women faculty in the schools of science and engineering at MIT. MIT Faculty Newsletter 18(4): 1, 16-23.

Are Non-U.S. AGU Members Underrepresented Among the AGU Fellows?

There is a perception that non-U.S. AGU members are underrepresented among the AGU Fellows and that they take longer to receive the honor. The latter is not the case: the average age of AGU members at the time they were elected Fellows, 2009-2013, is 57; the age for Fellows elected from non-U.S. countries is slightly younger, 56.¹⁵ Non-U.S. AGU members comprised 25% of all AGU Fellows elected between 2010-2013 (Figure 3) and 39% of all AGU members.¹⁶ The perception that non-U.S. members are underrepresented among Fellows is true.

Figure 3. Proportion of U.S. Fellows and Non-U.S. Fellows Elected Between 2010-2013



Are the Nominators Diverse?

Who nominates the Fellows? Women comprised only 10% of the Fellows nominators in 2012 and 11% in 2013, and non-U.S. scientists comprised 14% of Fellows nominators in 2012 and 2013 (Table 6). Thus, the underrepresented among the Fellows are also underrepresented among the nominators. This finding raised the question, is the process for nomination as transparent as it could be? Is the process overly onerous? Is the process something that the majority learns implicitly? If we can promote a more explicit, transparent, and simple nomination process, can we encourage the underrepresented to nominate qualifying AGU members for Fellow?

Table 6. Proportion of Fellows Nominators Who Are Women and Who Are of Non-U.S. Nationality

	Women	Men	% Women
2012	18	157	10%
2013	24	190	11%
	U.S.	non-U.S.	% non-U.S.
2012	150	25	14%
2013	184	30	14%

FINDING 1: The process for AGU Fellows nomination may not be widely known or understood. Underrepresented groups make fewer nominations (Figure 1), and there appears to be a myth that you must be a Fellow to even make a nomination (Tables 4a and 4b).

RECOMMENDATION 1: Publicize clear procedures for nominating AGU Fellows, including broader publicity of the nomination process already established. The Honors and Recognition

¹⁵ The age distribution of non-U.S. AGU members in 2013 is provided in Appendix D, p. 40.

¹⁶ For more detailed data on the number of non-U.S. candidates from 2010-2013, see Table D-1 in Appendix D, p. 40.

Committee should also publish an *Eos* article on this issue, and take action to dispel the myth that you must be a Fellow to even make a nomination.

FINDING 2: Thirteen percent of AGU members are of unknown gender, which makes it difficult to monitor bias in nomination and selection processes (Figure 2).

RECOMMENDATION 2: The Honors and Recognition Committee should encourage the AGU Membership Department to attempt to improve diversity performance tracking capability by reducing the number of “unknown” gender, age, race/ethnicity, and nationality of AGU members. AGU should encourage members upon renewal to provide this information, and members should be given the justification for collecting the data (to promote transparency and fairness in honors and recognition processes), and an explanation of what AGU will not do with their data (identify individuals).

Section and Focus Group Practices

Background

Text Box 1, shown earlier in this report, provides the Fellows process overview, and explains that the primary screening of candidates nominated for AGU Fellows is conducted by Section and Focus Group ranking committees.¹⁷ This initial screening and advancement of candidates for final evaluation by the Union Fellows Selection Committee is a critically important role and a quality assurance step for all Fellows candidates. Because of this critical role, the Task Force reviewed data showing the performance of these ranking committees in advancing diverse candidates for Fellows consideration.

Table 7. Number of Women, Men, U.S., and Non-U.S. Fellows Candidates and Successfully Elected Women and Non-U.S. Fellows by Primary Affiliation in 2013

Section or Focus Group Primary Affiliation	Candidates				Elected Fellows	
	Women	Men	U.S.	Non-U.S.	Women	Non-U.S.
Atmospheric Sciences	6	31	32	5	2	1
Atmospheric and Space Electricity *	0	2	1	1	0	0
Biogeosciences	3	5	5	3	1	0
Cryosphere *	1	3	3	1	0	0
Earth & Planetary Surface Processes	2	4	6	0	1	0
Geodesy	0	5	4	1	0	1
Geomagnetism and Paleomagnetism	1	4	3	2	1	1
Global Environmental Change	0	2	1	1	0	1
Hydrology	4	21	16	9	0	3
Earth and Space Science Informatics	0	0	0	0	0	0
Mineral and Rock Physics	0	3	3	0	0	0
Natural Hazards *	0	0	0	0	0	0
Near-Surface Geophysics	0	0	0	0	0	0
Nonlinear Geophysics *	0	2	2	0	0	0
Ocean Sciences	12	25	30	7	4	2
Paleoceanography and Paleoclimatology	3	8	10	1	1	0
Planetary Sciences	2	9	10	1	0	0
Seismology	2	11	3	10	1	2
Space Physics and Aeronomy	1	11	10	2	0	0
Study of the Earth's Deep Interior *	0	2	1	1	0	1
Societal Impacts and Policy Sciences *	0	0	0	0	0	0
Tectonophysics	3	12	13	2	1	0
Volcanology, Geochemistry, and Petrology	2	12	11	3	1	1
Total	42	172	164	50	13	13

*Denotes Focus Groups participating in the Joint Focus Group Fellows Committee in 2013¹⁸

¹⁷ Members of Section and Focus Group Fellows ranking committees are appointed as per AGU Section and Focus Group bylaws.

¹⁸ Current AGU practice encourages smaller Sections and Focus Groups to participate as a Joint Focus Group Fellows Committee to review and advance candidates to the Union Fellows Selection Committee, allowing a broader pool and to help address the issue of a perceived disadvantage to smaller Sections and Focus Groups.

Based on Task Force members' first-hand knowledge concerning the workings of the Section and Focus Group ranking committees, and feedback from AGU staff members supporting these committees, it was found that practices vary widely concerning these committee operations and their make-up. For example, some Sections and Focus Groups make a conscious effort to promote the importance of securing diverse nominations. The Task Force specifically reviewed and discussed practices of the AGU Ocean Sciences Section, in which 32% of its 2013 Fellows candidates were women, serving as a stand-out example of the apparent impact of conscious efforts (Table 7). Although the sample size is small, data showing diversity results by Section and Focus Group ranking committees also bears out differences in outcome.

Text Box 2: Guidelines for Canvassing Committees

AGU aims to achieve proportional recognition of underrepresented groups for Fellows and other AGU medals and awards. Specifically, it has been documented that women and non-U.S. members are underrepresented (see Finding 3a below). The Fellows Program Review Task Force therefore recommends the creation of a canvassing committee within each Section and Focus Group with the charter to proactively search for members, especially those in underrepresented groups, who likely meet the criteria of "scientific eminence" for selection as a Fellow, but who may have been overlooked in the past as potential nominees or who may have recently qualified. This committee should have a diverse composition with appropriate inclusion of underrepresented members. To avoid conflict of interest, members of this canvassing committee are excluded from the Section and Focus Group ranking committees that evaluate and rank nominations, and should not be current members of the Union Fellows Selection Committee.

The main functions of the canvassing committee are twofold, with a third as time permits:

First, to proactively search for suitable candidates for Fellows (other AGU awards may also be considered) who may have been overlooked in previous years or who may have recently been fulfilling the criteria for nomination. This search for potential nominees would include everyone — both genders, all ethnic groups, both U.S. and non-U.S. residents, and interdisciplinary scientists — and an emphasis should be placed on identifying the underrepresented members.

Second, once deserving candidates for nomination are identified, the committee shall then consider who might be encouraged to take the initiative to put together nomination packages for each of those individuals. Ideally, one or more of the committee members may take it upon themselves to contact those potential nominators and to pass on information about the nominating process and any other pertinent information about the candidate's perceived strengths. However, if that does not seem appropriate for whatever reason, the committee may recommend to the Section or Focus Group President some other path for encouraging the nomination. Canvassing committees shall also make AGU staff aware of their list of encouraged candidates so that staff can be on the watch for duplicate nominations.

Third, the Committee may prepare a list of up-and-coming members who may soon fulfill the criteria for Fellow nomination for future years.

Best practices for securing diverse nominations were discussed by this Task Force and have been documented and reported in the literature.¹⁹ These practices include the use of canvassing committees by Sections and Focus Groups to help increase diversity of the candidate pool prior to evaluation by the ranking committees (see Text Box 2). Other such practices are detailed and discussed in the Task Force's recommendations below. The AGU H&R Committee should continue its work to more aggressively communicate and promote best practices.

FINDING 3a: The pool of candidates nominated for Fellows selection has shown underrepresented gender and geographic diversity. Taken together, the data show that bias does not appear to be introduced during the stages of evaluation of nominations (Table 3), but rather in the nomination process itself, which results in disproportionately low percentages of women and non-U.S. members being nominated.

FINDING 3b: Sections and Focus Groups that have made a conscious effort to increase diversity in their nominations have had a more diverse set of candidates successfully elected as Union Fellows. There appears to be a relationship between specific practices for promoting and canvassing for diverse nominations (including a diverse committee membership), and successful diverse results.

RECOMMENDATION 3: Communicate documented best practices and guidelines to encourage and support more diverse nominations. This may include:

- Establish canvassing committees for each Section and Focus Group and provide them with guidelines to identify qualified and underrepresented candidates, and encourage diversification of committee membership.
- Provide and disseminate guidelines to ranking committees and encourage diversification of ranking committee membership.
- The Honors and Recognition Committee, in coordination with AGU staff, provide webinar training for canvassing, ranking, and Union Fellows Selection committees on implicit bias during each award selection cycle. Provide written documentation and video clips for these committee members and nominators to learn about implicit bias and assumptions. Have nominators read information about implicit bias and click a box on AGU website saying they have read implicit bias information before beginning nomination upload process.
- Canvassing committees should solicit from each new Fellow ~5 names of potential Fellow candidates. With the expectation that newer Fellows will be more diverse, the Task Force intends for this to be a way to increase diversity. Canvassing committees would then work to find nominators for these potential candidates.
- The data from 2009 through 2013 constitute a baseline for future assessment of diversity performance. To help improve nomination diversity, AGU should assure adoption of canvassing committees, continue to collect data on diversity performance, distribute these performance data to members of canvassing and ranking committees and more broadly publicize these diversity performance data to the broader AGU membership. Transparency should be increased by publishing in *Eos* each year: "In the pursuit of excellence, here are the data on AGU Fellows..."

¹⁹ See, for example, *Eos*, Vol. 94, No. 10, 5 March 2013, "Consider Nominating a Woman for an AGU Award."

- Recommend AGU Governance Committee consider asking Sections and Focus Groups to incorporate the mindfulness of diversity issues discussed in this report for Fellow nominations as they go through their processes of nominating candidates for Section and Focus Group officers. Although these are separate processes, the use of consistent approaches to nomination procedures will likely be reinforcing.

FINDING 4: There is a wide variety of practices used among Section and Focus Group ranking committees and Union Fellows Selection Committees.

RECOMMENDATION 4: Provide and disseminate guidelines to Section and Focus Group ranking committees and the Union Fellows Selection Committee describing best practices. These best practices include:

- Diversify Section and Focus Group ranking committees, including adding underrepresented (e.g., younger, non-Fellow, non-U.S., and women) members. In doing so, any potential conflict with Section and Focus Group bylaws and conflict of interest policy should be resolved to be compatible with Union bylaws.
- Each committee chair appoint at least one committee member to serve as an Equity Advisor, who has been trained by AGU to understand implicit bias and guide the committee to avoid it. The Equity Advisor also points out gender bias in tone of supporting letters. The Association for Women in Science (AWIS)²⁰ is a good source for training.
- Request that each Section and Focus Group ranking committee has at least one teleconference to discuss each nomination, and to rank nominations. A committee member should take notes to ensure constructive feedback to nominators of unsuccessful packages.
- Ensure that each candidate receives equal consideration relative to their individual merit, regardless of familiarity of the committee members with the candidates. In other words, candidates should not be dismissed because no member of a Section or Focus Group ranking committee personally knows of his/her work.
- Capture institutional memory from past-leaders of ranking and selection committees by having AGU conduct “plus/delta” evaluations. A plus/delta evaluation is typically administered immediately following a committee’s deliberations, and is used to assess what worked well and what could be improved upon for the future.

²⁰ Association for Women in Science (AWIS): https://awis.site-ym.com/?Awards_Outcomes

AGU FELLOWS SELECTION CRITERIA AND ALLOCATION PROCESS

Background

As follow-on to the nomination process for AGU Fellows (described in Section 4 of this report), the overall AGU Fellows selection and allocation process was found to have specific issues of concern.²¹ Also, the Task Force charge requested an examination of the current use of allocated quotas in the Fellows selection process. This section of the report is organized to first present a review and discussion of existing Fellows selection criteria, and is followed by a discussion of the Fellows “allocation process.” Task Force findings and recommendations are suggested for improving both.

Fellows Selection Criteria

To be elected a Union Fellow is a tribute to those AGU members who have made exceptional contributions to Earth and space sciences as valued by their peers, vetted by Section and Focus Group committees, and selected by the Union Fellows Selection Committee. Eligible Fellows nominees must have attained demonstrable eminence in the Earth and space sciences.

The current primary criteria for evaluation of scientific eminence are:

- (1) major breakthrough,
- (2) major discovery,
- (3) paradigm shift, and/or
- (4) sustained impact

Text Box 3: Proposed New Criteria for Selecting Fellows

The Task Force recommends adopting the following criteria for evaluation of scientific eminence in the Earth and space sciences through achievements in research, as demonstrated by one or more of the following:

- (1) breakthrough or discovery;
- (2) innovation in disciplinary science, cross-disciplinary science, instrument development, or methods development; and/or
- (3) sustained scientific impact

²¹ See Text Box 1, page 9, for an overview of the AGU Fellows process.



The Task Force examined the criteria for Fellows selection to ensure their relevance and alignment with AGU's mission and core values. As made clear through AGU's mission statement, the purpose of the American Geophysical Union is to promote discovery in Earth and space science for the benefit of humanity. And as an organization, AGU holds a set of guiding core values, which are to be reflected in all of its operations. These core values are:

- The scientific method
- The generation and dissemination of scientific knowledge
- Open exchange of ideas and information
- Diversity of backgrounds, scientific ideas and approaches
- Benefit of science for a sustainable future
- International and interdisciplinary cooperation
- Equality and inclusiveness
- An active role in educating and nurturing the next generation of scientists
- An engaged membership
- Unselfish cooperation in research
- Excellence and integrity in everything we do

FINDING 5: The current criteria for selecting Fellows need revision, in part because they do not recognize interdisciplinarity, and because the term “paradigm shift” is loosely defined and describes something that often cannot be recognized until long after it happened.

RECOMMENDATION 5: Adopt the following criteria for evaluation of scientific eminence in the Earth and space sciences through achievements in research, as demonstrated by one or more of the following:

- (1) breakthrough or discovery;
- (2) innovation in disciplinary science, cross-disciplinary science, instrument development, or methods development; and/or
- (3) sustained scientific impact

Fellows selection criteria should be revised in light of recommendations for best practices discussed in this report. A significant change is the addition of criterion 2, which recognizes the breadth of research contributions to the Union. This change will also help recognize broader

importance of inter- or cross-disciplinary science²² and the growing trend and importance of data science.

Fellows Allocation Process

In practice, Section and Focus Group committees are responsible for reviewing and ranking all nominees for Fellowship who have a primary affiliation with their Section or Focus Group or have been directed to the group by a nominator. If the nominee has been directed by the nominator to more than one group, the nominee will appear on all of those groups' lists.

Table 8. Fellows Candidate Allocation by Section and Focus Group in 2013

Section or Focus Group	Allocated Candidates (based on 0.2% primary affiliation membership)	Final Number of Candidates Ranked*
Atmospheric Sciences	15	16
Atmospheric and Space Electricity **	1	1
Biogeosciences	7	10
Cryosphere **	2	3
Earth & Planetary Surface Processes	3	4
Geodesy	2	2
Geomagnetism and Paleomagnetism	2	3
Global Environmental Change	4	6
Hydrology	14	17
Earth and Space Science Informatics	1	0 ***
Mineral and Rock Physics	4	5
Natural Hazards **	1	1
Near-Surface Geophysics	2	3
Nonlinear Geophysics **	0	-
Ocean Sciences	14	17
Paleoceanography and Paleoclimatology	3	5
Planetary Sciences	4	5
Seismology	7	7
Space Physics and Aeronomy	7	7
Study of the Earth's Deep Interior **	1	1
Societal Impacts and Policy Sciences **	0	-

²² The Fellows Program Review Task Force adopted the working definition of interdisciplinary research as used by the National Science Foundation, and as spelled out in a National Academies report: National Research Council (2004), *Facilitating Interdisciplinary Research*, Committee on Facilitating Interdisciplinary Research, Committee on Science, Engineering, and Public Policy, The National Academies Press, Washington, D.C., p2. Interdisciplinary is defined as *a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice.*

Tectonophysics	6	7
Volcanology, Geochemistry, and Petrology	8	9
<p>*The final number of candidates ranked may exceed the allocated amount due to candidate sharing. Nominees shared by multiple Sections or Focus Groups count as ½ of an allocated nomination to each.</p> <p>**Denotes Focus Groups participating in the Joint Focus Group Fellows Committee in 2013. Joint Focus Group allocation total: 5 candidates + 1 (nominee sharing) = 6 ranked candidates</p> <p>***Earth and Space Science Informatics did not participate in the Joint Focus Group Fellows Committee in 2013.</p>		

The total number of reviewed nominated candidates allowed for forwarding to the Union Fellows Selection Committee by each Section and Focus Group (i.e., the Fellows allocation) is based on the percentage of AGU members with primary affiliations to their group. In this allocation process, each Section and Focus Group ranking committee is allowed to advance a number of candidates no greater than 0.2% of its primary affiliation membership. The allocation to each Section and Focus Group for 2013 is shown in Table 8.²³

The practice of allocating by scientific discipline has been debated and criticized by some as being unfair to smaller AGU Sections and Focus Groups, and as being not well-suited for advancing and recognizing candidates working in emerging areas of science or in cross-disciplinary science that do not fit well within one of the AGU established disciplines.

The Task Force did not reach consensus on need for adapting an added allocation or “special fields” discipline process for AGU. The Task Force believes additional data and significantly more study would be needed before such an undertaking.

FINDING 6: The current system of allocating Fellows nominations to Sections and Focus Groups based on size of the individual Section or Focus Group (i.e., the number of AGU members indicating primary affiliation with that Section or Focus Group) appears to work to the satisfaction of most, but with some deficiencies perceived by smaller Sections and Focus Groups (Table 8). The Task Force was unable to reach consensus on whether additional interventions are warranted or workable in the AGU context, as related to the current Fellows nomination allocation process.

RECOMMENDATION 6: The Task Force recommends AGU continue to study and explore these issues of allocating Fellows nominations further, perhaps as part of a follow-on effort to evaluate the effectiveness of the specific recommendations from this report that are adopted.

²³ Sections and Focus Groups that elect to review all nominees affiliated with their group will be eligible for nominee sharing. In the event that a nominee is ranked and put forward by more than one group, that nominee will count as the reciprocal of the number of groups that put the nominee forward. For this reason, each Section and Focus Group committee is requested to rank its entire list of nominees, or at minimum submit at least five names above its allocation in case additional names are needed.

7

LIMITATIONS OF THE H-INDEX

Background

The h-index was developed by Hirsch in 2005²⁴ to quantify the scientific research output of individuals, to characterize not only the number of publications, but their impact as measured by the number of times each publication has been cited. Hirsch asserted that his index should be applicable across disciplines. The h-index has since been applied to publications and to whole departments and institutions.

How the H-index Is Calculated

The h-index is calculated as the number of a person's publications that have been cited at least as many times as that number. For example, if an author has an h-index of 34, 34 of the author's publications have been cited at least 34 times.

The h-index may be calculated using a number of tools, such as:

Google Scholar: <http://scholar.google.com> If a scientist has set up a Google Scholar profile, then it is easy to find that person's h-index. But if not, there is no way to calculate a Google Scholar profile for others. There is an h-index add-on for Firefox, <https://addons.mozilla.org/en-US/firefox/addon/scholar-h-index-calculator/> but it does not work on all computers, and requires a particular browser.

Web of Knowledge (Thomson Reuters): <http://wokinfo.com> This requires a subscription, so is not available to all nominators. Furthermore, even institutions with subscriptions may not have paid for the entire database. For example, at Rutgers University it only starts in 1984.

Scopus (Elsevier): <http://www.elsevier.com/online-tools/scopus> This also requires a subscription.

²⁴ Hirsch, J. E. (2005), An index to quantify an individual's scientific research output. *Proc. Nat. Acad. Sci. USA*, 102(46), 16,569-16,572. <http://www.pnas.org/content/102/46/16569.full.pdf+html> (Google: [Cited by 3785](#))

Factors That Affect the Value of the H-Index

Although Hirsch expected the h-index to be a uniform indicator of a scientist's research output, bibliometric analyses reveal its limitations. An h-index should not be used alone to measure a scientist's impact on the discipline. Among the limitations revealed are:

Which Bibliometric Database is Used

For example, from <http://wokinfo.com/googlescholar/>: "Why are there sometimes differences between the citation counts shown by Google Scholar versus Web of Science? The principle source of difference is the set of publications included in either service. Web of Science Core Collection counts are based on a curated database of published, peer-reviewed content that is selected according to publicly available standards. Google Scholar counts are based on a diverse and larger set of publications including published articles, preprints, theses, books, and court opinions."

Furthermore, as Google Scholar is free, but Web of Science and Scopus require a subscription, access to the databases will differ among different nominators and letter writers. And, not all institutions with subscriptions to Web of Science or Scopus have paid for the complete database.

Gender of the Scientist

Men tend to cite their own research more than women do, leading to higher h-indices for men.^{25,26} Women are less likely to toot their own horn, feeling that it is bragging. Use of the h-index to assess merit for an honor or award will thus tend to disadvantage women scientists. Also, men and women tend to write letters of recommendation for women that are less enthusiastic.²⁷ These small accumulations of disadvantage can lead to gender inequity in honors and recognition selection.²⁸

Name of the Scientist

Unusual, unique names are easy to identify in searches, but common names are often hard to separate from others whose publications are in the same database. The ongoing development of unique researcher identification numbers, such as Orcid (<http://orcid.org/>) or Researcher ID (<http://www.researcherid.com/>) will eventually solve this problem, and AGU is urging all authors to obtain an Orcid and use it in their publications. But until this problem is solved, great care is needed to go through every publication listed in the h-index calculation to make sure it is one by the person for whom the calculation is made.

Age of the Scientist

The h-index has been shown to increase with increased age of the scientist (the longer the publication has been around the more it will have been cited). And one important, groundbreaking paper may have lots of citations, but the scientist has not had many other publications that have had time to accumulate citations.

²⁵ King, M. M., S. J. Correll, J. Jacquet, C. T. Bergstrom, and J. D. West (2013), Gender and self citation across fields and over time. Accessed at: <http://www.eigenfactor.org/gender/self-citation/SelfCitation.pdf>.

²⁶ Maliniak, D., R. Powers, and B. F. Walter, (2013) The gender citation gap in international relations. *International Organization*, Available on CJO 2013 doi: 10.1017/S0020818313000209. http://journals.cambridge.org/abstract_S0020818313000209

²⁷ Trix, F., and C. Psenka, (2003), Exploring the color of glass: Letters of recommendation for female and male medical faculty. *Discourse & Society*, 14(2), 191-220.

²⁸ Valian, V. (1999), *Why So Slow?: The Advancement of Women*. MIT press.

Discipline and Impact Factor of Journal

Studies have found that the number of citations varies by discipline and is influenced by the impact factor of the journals where papers are published.²⁹ So comparison of h-index, even among the different AGU disciplines, will produce unfair comparisons.

Number of Papers the Scientist Has Published

The h-index is widely thought to be a good qualitative indicator of a scientist’s impact on his or her discipline; however, studies have found that the h-index is quantitative, not qualitative.³⁰ They found that the higher the number of papers authored by a given scientist, the higher his or her h-index will be. This reflects numbers of publications, not citation rate nor impact on the discipline.

The French Academy of Scientists concluded in 2011, “Bibliometrics have enormous potential to assist the qualitative evaluation of individual researchers; however, none of the bibliometric indicators alone (or even considering a set of them) allow for an acceptable and well-balanced evaluation of the activity of a researcher.”³¹

For the above reasons, the Task Force recommends caution in using h-index as a primary indicator when selecting AGU Fellows. Analysis of the data also reveals that there is no significant difference between the average h-index of elected and unelected Fellows candidates (Table 9).

Year	Average H-Index of Unsuccessful Fellow Candidates	Average H-Index of Elected Fellows
2011	29.95	30.02
2012	29.90	30.00
2013	30.20	30.14

* These data include the h-indices of all candidates as calculated by their nominators using a variety of tools (i.e., Google Scholar, Web of Science, and Scopus).

FINDING 7: The h-index is an imperfect measure of eminence. While a scientist’s h-index does provide some information, the limitations of the h-index include that it:

- depends on the bibliometric database used, and not all databases are freely available,
- is biased against women,
- varies widely based on the discipline of the scientist, and
- does not indicate how much a scientist contributed to a particular publication.

RECOMMENDATION 7: The Task Force recommends the following changes to the current use of the h-index in AGU Fellow assessments:

²⁹ Slyder, J. B., et al. (2011), Citation pattern and lifespan: A comparison of discipline, institution, and individual. *Scientometrics*, 89(3), 955-966.

³⁰ Gaster, N., and M. Gaster (2012), A critical assessment of the h-index. *Bioessays*, 34(10), 830-832.

³¹ cited in Gaster, N., and M. Gaster (2012), A critical assessment of the h-index. *Bioessays*, 34(10), 830-832.

- The h-index will no longer be required as part of a nomination package.
- If the h-index is used in a nomination package or is mentioned in letters, it is incumbent on the writer to include the source of the h-index and a URL that has been uniquely identified for the candidate's h-index calculation.
- If the h-index is used, it is meant to be compared only within the same scientific discipline.
- This report should be provided to all members of AGU medals and awards committees to make them aware of the shortcomings of the h-index.
- For the longer term, the Honors and Recognition Committee should work with AGU staff to provide a summary of current research on the h-index, and commission a study of the h-index to determine shortcomings, biases, and differences between disciplines, genders, and countries. The outcome of that study will inform future changes in how the h-index is to be used.

8

HOLD-OVER NOMINATIONS

Background

AGU staff provided the following information on current and past procedures related to hold-over of Fellows nominations. The Task Force then examined the following areas and questions:

- What are the data and success rates on hold-over nominations?
- How does hold-over impact the selection process to Fellow?
- Are hold-over nominations used by all Section and Focus Group committees and all Union medals and awards committees?
- How could a standard hold-over practice help the Fellows process achieve its objectives?

Sections and Focus Groups are not responsible for the hold-over process. In the past, the Union Fellows Selection Committee has determined which, if any, unsuccessful nominations are held-over for the next nomination cycle. If a nomination is held-over, then there is no need for the candidate's package to be re-submitted in the next cycle, whereas those not held-over need to be re-submitted. However, if in a given year, the Union Fellows Selection Committee determines that there will be no hold-overs then the nomination packages of all nominees who are not chosen as Fellow must be resubmitted during the next cycle.

Historically, the hold-over policy was established for Union awards and medals, both of which tend to receive a substantially smaller number of nominations in comparison to the Union Fellows program. After a Union awardee or medalist has been selected, the Union awards and medals committees deliberate to determine if the remaining nominees are considered unsuccessful or held-over for the next cycle. A nominee may be held-over for two consecutive nomination cycles by a Union Award, Medal, or Prize Committee, and in some instances, for an additional cycle if recommended.

During the 2010-2012 Union Fellows Selection Committee's term of service, it was decided that the Union Fellows program should follow this policy as well. However, because the Union Fellows Selection Committee has only one or two days to deliberate on approximately 115 nominees, it was impossible for committee members to deliberate about which of the unsuccessful candidates should be held-over. Ultimately, it was decided that if there was no conflict of interest in the next nomination cycle, all remaining nominees who were not elected would be automatically held-over for one nomination cycle, which was implemented during the 2010-2012 nomination cycles. In 2013, the Union Fellows Selection Committee opted not to hold-over any candidates for the following year's nomination cycle.

The conclusion is that there is not a current guideline for establishing or handling hold-over nominations during the Fellows selection process, so the practices have been inconsistent over the past several years.

Observations

The Fellows selection process involves evaluation of a rather large number of files. Because hold-over decisions can occur only at the level of the Union Fellows Selection Committee, time pressures limit the ability for making well-founded choices on who to hold-over. Even when hold-overs occur, the Task Force believes that nominators should be given the opportunity to update the nomination package. This makes the distinction between a hold-over nomination and a resubmission somewhat subtle. In either case, a critical issue for a nominator is to get feedback on issues discussed and what needs to be done to strengthen a nomination. AGU has established procedures for generating feedback. AGU staff should ensure a process is in place to provide timely and useful feedback on all unsuccessful candidates. If a nominator chooses to resubmit, explicit criteria should be addressed based on the feedback suggested for unsuccessful nomination packages.

The current procedures are as follows:

Section and Focus Group Ranking Committee Feedback Procedure

- Feedback is provided upon request of a nominator. After the newly elected class is announced, nominators may submit feedback requests to AGU staff.
- AGU staff logs each feedback request and forwards them to (1) the nominee's primary Section or Focus Group ranking committee chair and, if applicable, (2) to any secondary Section and Focus Group ranking committees that were selected by the nominator during the initial submission stage. AGU staff provides the appropriate chairs with the nominator's initial email request as well as the nominator's telephone number and email address.
- Upon nominator request, each Section or Focus Group ranking committee chair is required to provide feedback to nominators.
- AGU provides Section and Focus Group ranking committee chairs with a template which provides suggested text that may be used when giving nominator feedback.

Union Fellows Selection Committee Feedback Procedure

- AGU staff takes notes during the face-to-face deliberations at which each allocated candidate is discussed.
- After the newly elected class is announced, nominators may submit feedback requests to AGU staff.
- Upon nominator request, AGU staff logs each feedback request and provides an explanation directly to nominators.
- If nominators still require more feedback, then the Union Fellows Selection Committee member who is primarily responsible for representing this candidate during the deliberations will provide further commentary regarding the nomination.
- If a Section or Focus Group ranking committee chair requests feedback, the Union Fellows Selection Committee chair will gladly provide commentary regarding any nominee or the rationale during the evaluation process. (The feedback process will be enhanced in the future in that new software will allow information to be conveyed to nominators automatically.)

Conclusions

Given that it is unlikely that a serious deliberative process could be devised to allow the Union Fellows Selection Committee to choose which nominations to hold-over without an unrealistic commitment of time and resources, the Task Force considers that the only reasonable choice is the one used by the Union Fellows Selection Committees in 2012 and 2013, namely either hold-over all or none of the candidates that are not selected in a given year. Because the Task Force thinks that updating a nomination package following feedback is required for hold-overs as well as resubmissions and because a separate evaluation of new submissions and resubmissions by Section and Focus Group ranking committees each year is important, the Task Force recommends that a policy be adopted that Fellows nominations are not held-over. Furthermore, as compared with getting an initial nomination package together, resubmitting is a relatively easy process.

FINDING 8: AGU has used inconsistent practices concerning hold-over nominations for Union Fellows candidates not selected in a given year. The decision to use or not use hold-over nominations has been left to the Union Fellow Selection Committees. Furthermore, data indicate that hold-over nominations are elected at a similar rate as first time nominees.

RECOMMENDATION 8: AGU adopt a consistent practice of no hold-over nominations for the Union Fellows Selection Committee. For nominees not elected to Fellow, Sections and Focus Groups should solicit updated nominations, and feedback from the Union Fellows Selection Committee should be provided to the nominator and to Section and Focus Group ranking committees.

9

OPPORTUNITIES FOR ENGAGEMENT

Background

The charge of this Task Force focused on an examination of the AGU Fellows nomination and selection process, including requests for recommendations in targeted areas. During the course of this work, the Task Force also examined practices of many other scientific societies related to their highest scientific honorees.³² This examination revealed additional opportunities for AGU to engage with Fellows once elected. Although “engagement opportunities” is beyond the charter of the Task Force, we believe this opportunity is one worth bringing to the attention of AGU Leadership.

Table 10. Number of All Living AGU Fellows by Gender, Geography, and Age	
Gender	Number of Living AGU Fellows
Men	1,185
Women	139
Geographic Region	Number of Living AGU Fellows
United States & Territories	1,033
Western Europe	175
Southeast Asia	40
Western Pacific	33
Canada	33
North Africa & Middle East	5
Eastern Europe	3
Latin America & Caribbean	2
Central & South Africa	0
Age	Number of Living AGU Fellows
Under 25	0
25-34	1

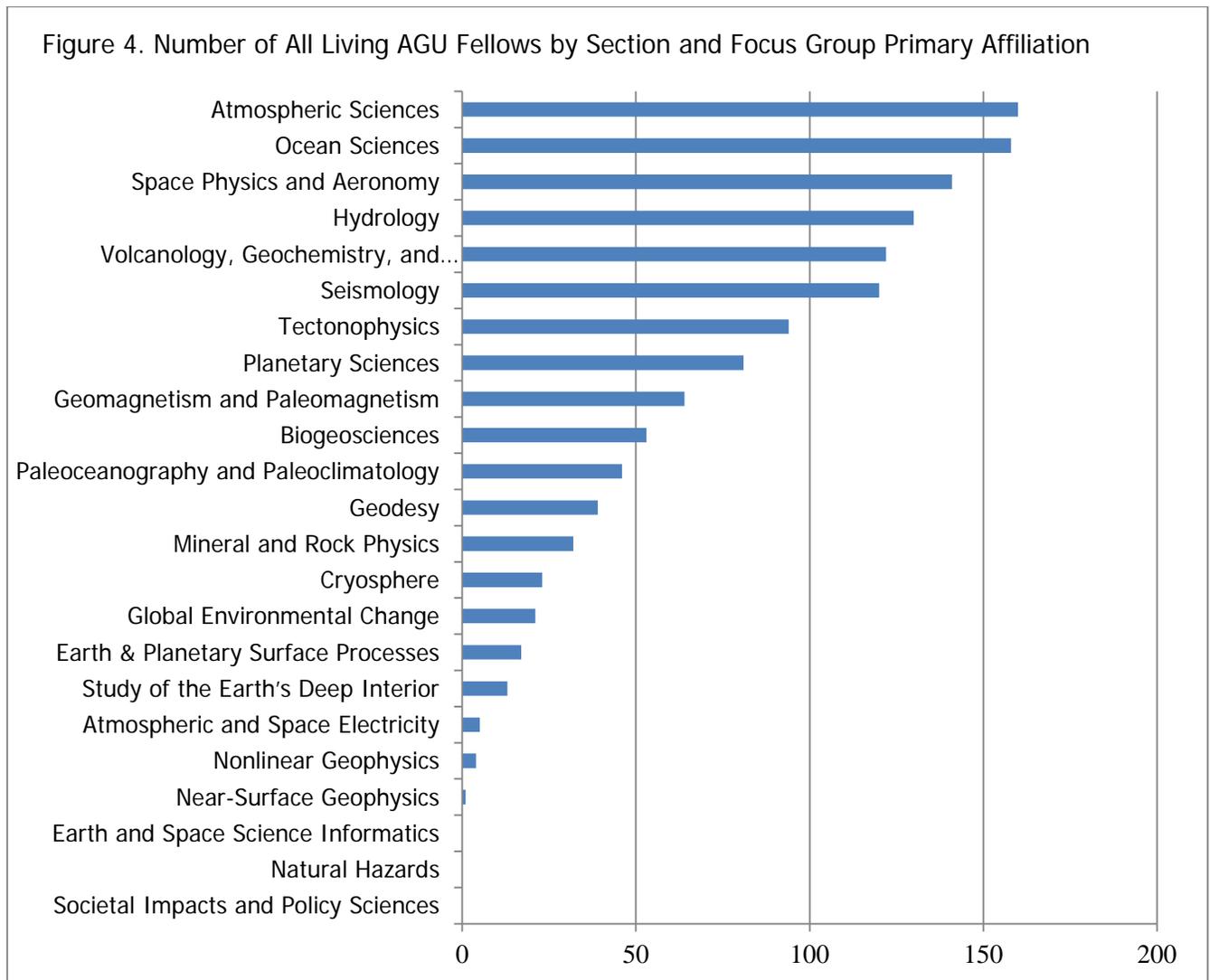
³² As part of this work, the Task Force examined practices of other scientific societies in nominating and selecting their highest scientific honorees, including the National Academies, American Physical Society (APS), American Institute of Architects (AIA), American Chemical Society (ACS), Geological Society of America (GSA), American Institute of Chemical Engineers (AIChE), American Association for the Advancement of Science (AAAS), American Meteorological Society (AMS), and Institute of Electrical and Electronics Engineers (IEEE).

35-44	29
45-54	124
55-64	375
65-74	461
75+	322
Unreported	12

A Rich Untapped Opportunity

During the year AGU Fellows are elected, each newly elected Fellow is recognized and honored at the annual AGU Fall Meeting. Each Fellow also receives a medallion, and names of elected Fellows are widely publicized in AGU publications and website along with brief scientific citations. AGU has elected nearly 2,000 Fellows since the program inception in 1962; however, AGU currently does not have programs for engaging or tapping into this set of members beyond the activities at the AGU meeting and the publications of names.

There are currently over 1,300 living AGU Fellows representing a broad range of geographic regions and age groups (Table 10), as well as Sections and Focus Groups (Figure 4). The Task Force views this member segment as a rich untapped resource for the organization, and suggests an organization of the AGU “College of Fellows.” Task Force members believe such an AGU College of Fellows would be uniquely positioned for engagement on items such as mentorship, providing endorsement on scientific position papers, and fundraising. The Task Force believes this represents a missed opportunity that should be vigorously pursued.



FINDING 9: AGU has elected nearly 2,000 Fellows since the program’s inception in 1962, but does not have any programs for formally tapping into this group for their service and other contributions to AGU. Other organizations, such as the National Academies, have such programs for their highest honorees.

RECOMMENDATION 9: The Honors and Recognition Committee should explore the concept of a College of Fellows whose members could contribute to outreach, education, mentoring, shadowing, position statements, and development. Exploration and support for such an effort may best be pursued through appointment of a separate task force appointed by the AGU President.

APPENDICES

APPENDIX A

TASK FORCE CHARGE

Charge and Timeline for AGU Fellows Program Review Task Force

The AGU Fellows Review Task Force is charged with reviewing the current AGU Fellows selection process and making recommendations to the Honors and Recognition Committee for any potential changes that might improve perceived gaps in the selection of interdisciplinary science candidates, women candidates, or candidates from other underrepresented groups, while maintaining current Fellows prestige. This group's examination will include a review of:

- data from Fellows' selection processes for the past several years to determine if the program is operating maximally in terms of the relevant goals of the Union's Strategic Plan and how science is evolving;
- the current process of selection based on Section and Focus group membership;
- the current use of allocated quotas in the selection process;
- the process for hold-over nominations that are not successful in a given year;
- the role of the h-index in selecting AGU Fellows;
- the current AGU outreach practices to solicit Fellows nominations; and
- best practices of other scientific societies for selecting candidates to receive highest scientific honor.

The Task Force is anticipated to meet 3-4 times (primarily virtually, with assistance from AGU staff) and is requested to present preliminary findings and recommendations at the December 2013 Honors and Recognition committee meeting.

Composition Criteria for AGU Fellows Program Review Task Force

The Fellows Review Task Force will have the following targeted composition:

- 10-14 members;
- no less than 50% of Task Force members will be past AGU Fellows (elected or conferred);
- two members of Task Force will be members of the Honors and Recognition Committee;
- at least one member of the Task force will be a past AGU Fellows Committee chair;
- the committee will represent geographic, gender, ethnic, and Section and Focus Group diversity to the extent practical; and
- at least two early-career scientists.

APPENDIX B

FELLOWS NOMINATION GUIDELINES AND ANNUAL PROCESS TIMELINE

I. Nomination Guidelines

Evaluation Criteria

The Fellows program recognizes AGU members who have made exceptional contributions to Earth and space sciences as valued by their peers and vetted by Section and Focus Group committees. Primary criteria for evaluation in scientific eminence are major breakthrough/discovery, paradigm shift, and sustained impact.

Membership Eligibility

A nominee must have been an active AGU member for each of the 3 years immediately prior to the nomination. Active membership simply refers to the renewal of AGU membership for the past three consecutive years. For example, if a member joined AGU in 2011 and has renewed his or her AGU membership in 2012 and 2013, he or she is eligible for consideration during the 2014 Fellows nomination process.

Nomination Eligibility

Ineligible Nominees. The following individuals and/or groups are not eligible to be candidates for Union Fellows during their terms of service:

- AGU President;
- AGU President-elect;
- Council Leadership Team members;
- Honors and Recognition Committee members;
- Section and Focus Group presidents and president-elects; and
- Union Fellows Committee members are ineligible to be Fellows candidates. Section/Focus Group Fellows Committee members are ineligible to be candidates for consideration by their respective section/focus group.

Relationship to a Fellows Nominee. AGU policy on the relationship to a nominee is applicable to committee members, nominators, and supporters.

The following relationships need to be *identified and communicated* to Fellows selection committees, but *will not disqualify* individuals from participating in the nomination or committee review process:

- Current dean, departmental chair, supervisor, supervisee, laboratory director, an individual with whom one has a current business or financial relationship (e.g., business partner, employer, employee);
- Research collaborator or co-author within the last three years; and/or
- An individual working at the same institution or having accepted a position at the same institution.

Individuals with the following relationships are disqualified from participating in the Fellows nomination or committee review process (i.e., nominator, supporter, or committee member):

- A previous doctoral or graduate advisor, graduate student, or postdoctoral fellow may not write a **nomination letter** but may write a **supporting letter** after five years of terminating their relationship with the nominee beginning on 1 January after the year the relationship was terminated.

Termination of a relationship is defined as follows:

- nominee no longer being paid by supporter
- nominee no longer supported under the same grant or contract
- Family member, spouse, or partner;
- AGU President;
- AGU President-elect;
- Council Leadership Team members;
- Honors and Recognition Committee members;
- Section and Focus Group presidents and president-elects; and
- Nominator/supporter should not be a member on the Union Fellows Committee or any
- Section or Focus Group Selection committee that will review the candidate(s).

For more details, please review the AGU conflict of interest policy.³³

Additional Conflicts. Members of Fellows selection committees may, for other reasons, determine that they have conflicts – or potential conflicts – that require elimination from service and then act on that determination if they believe that service could affect the fairness of the selection process.

Nomination Requirements

- The nominee's AGU join date (year);
- The nominee's primary section or focus group affiliation; and
- The nominee's Hirsch index (i.e., h-index) score. Please note that the h-index is required, but plays only a secondary role in evaluation.

Nomination packages should contain the following files, which should be **no more than two (2) pages in length per document**:

1. Nomination letter with one sentence citation (i.e., citation should be 150 characters or less including punctuation and spacing);
2. Nominee's curriculum vitae;
3. Nominee's selected bibliography with a brief, introductory summary (i.e., no more than one paragraph);
4. A minimum of 3 but no more than 5 letters of support (total does not include nomination letter). Please refer to the "Nomination Eligibility" section prior to selecting supporters.

Submissions sent via postal or courier delivery only: All packages sent via mail or courier delivery should include a completed cover sheet. (The online submission system will generate a cover sheet for nominators.)

³³ AGU Conflict of Interest Policy: <http://honors.agu.org/agu-conflict-of-interest-policy-union-sections-focus-groups-fellows-medals-awards-prizes-lectures-program-selection-committees/>

Nomination Submissions

Fellows nominations can be submitted (1) online or (2) by regular mail delivery. However, to expedite the submission process, the online submission system should be used.

II. AGU Internal Timeline for 2014 AGU Fellows Nomination and Selection Process

15 January 2014	Fellows Nomination submission site opens
15 March 2014	Fellows Nominations submission site closes
3 April 2014	Teleconference overview of the selection process with Section/FG Fellows Committee chairs and Union Fellows Committee Chair
8 April 2014	Packages to Section/FG Fellow Committee Chairs for review
13 May 2014	Section/FG Committee deadline for submission of ranking letters
16 May 2014	Packages to Union Fellows Committee for review
29 May 2014	Deadline for submission of Union Fellows Committee primary and secondary presenter preferences
4 June 2014	Completed list of nominee assignments to Union Fellows Committee
20 June 2014	Deadline for submission of initial Union Fellows Committee rankings
23 June 2014	Consolidated rankings provided to Union Fellows Committee
26 June 2014	Union Fellows Committee teleconference to complete first round selection and elimination
27 June 2014	Updated ranking spreadsheets and list of selected/not selected nominees to Union Fellows Committee
10–11 July 2014	Union Fellows Selection Committee Meeting (Two full days)
25 July 2014	2014 Fellows notified by Union President
28 July 2014	Headquarters notifies all nominators, Board, Council, AGU Membership, and public of the 2014 class of Fellows
29 July 2014 (tentative)	2014 class of elected Fellows published in <i>Eos</i>
17 December 2014	AGU Honors Ceremony and Banquet held during Fall Meeting

APPENDIX C

LIST OF TABLES AND FIGURES

Tables

- Table 1 – Women and Non-U.S. Residents as Growing Percentages of AGU Members
- Table 2 – Overall AGU Member Demographics in 2012
- Table 3 – Gender and Geographic Diversity of Nominees at Each Stage of the 2013 Fellows Process
- Tables 4a and 4b – Success Rate Profile for AGU Fellows Candidate Selection 2012-2013
- Table 5 – Proportion of AGU Fellows Who Are Women 2009-2013
- Table 6 – Proportion of Fellows Nominators Who Are Women and Who are of Non-U.S. Nationality
- Table 7 – Number of Women, Men, U.S., and Non-U.S. Fellows Candidates and Successfully Elected Women and Non-U.S. Fellows by Primary Affiliation in 2013
- Table 8 – Fellows Candidate Allocation by Section and Focus Group in 2013
- Table 9 – Average H-Indices of Elected Fellows and Unsuccessful Candidates
- Table 10 – Number of All Living AGU Fellows by Gender, Geography, and Age

Figures

- Figure 1 – Fellows Nominators by Gender and Nationality 2012-2013
- Figure 3 – Proportion of U.S. Fellows and Non-U.S. Fellows Elected Between 2010-2013
- Figure 2 – Gender of AGU Members in 2013
- Figure 4 – Number of All Living AGU Fellows by Section and Focus Group

Text Boxes

- Text Box 1 – Overview of the AGU Fellows Process
- Text Box 2 – Guidelines for Canvassing Committees
- Text Box 3 – Current Criteria for Selecting Fellows

APPENDIX D

SUPPLEMENTAL TABLES AND FIGURES

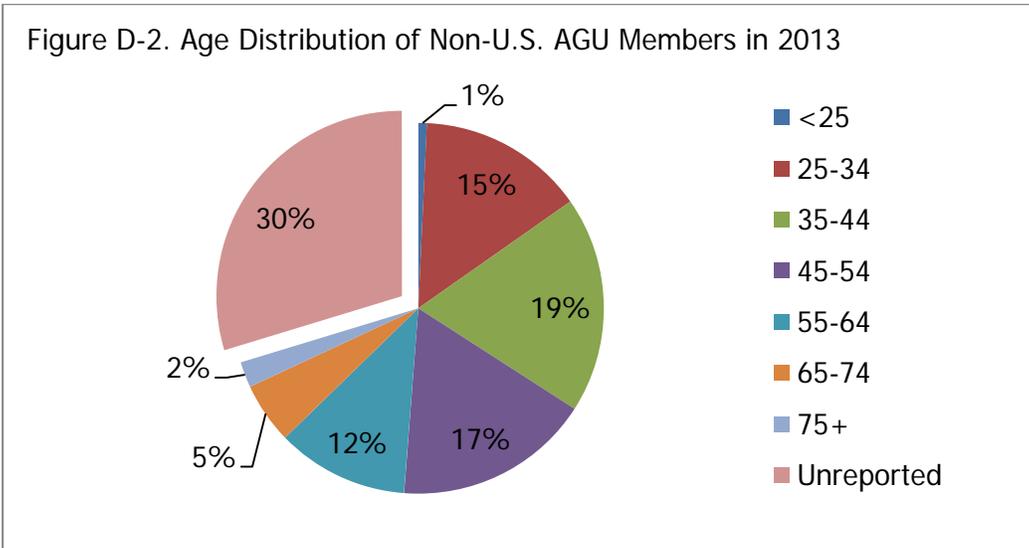
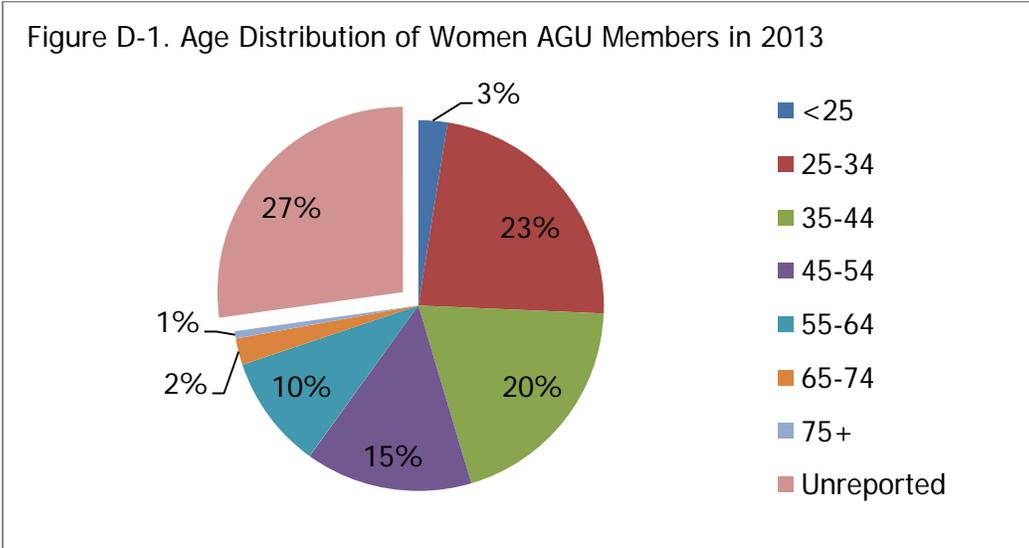


Table D-1. U.S. and Non-U.S. Fellows Candidates from 2010-2013

Year	Total Number of Nominees	Total Number of Fellows Elected	Non-U.S. Nominees	Non-U.S. Elected	% of Total Nominee Non-U.S.	% of Total Elected Non-U.S.
2010	161	58	46	17	29%	29%
2011	186	60	47	12	25%	20%
2012	175	61	56	16	32%	26%
2013	214	62	50	13	23%	21%

APPENDIX E

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