

1 **Volcanologists - Who are we and where are we going?**

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13 **Abstract**

14 Equity, diversity and inclusivity (EDI) are principles all scientific groups and organisations should
15 strive to achieve as they secure working conditions, policies and practices that not only promote
16 high-quality scientific output but also well-being in their communities. In this article, we reflect on
17 the progress of EDI in volcanology by presenting data related to memberships of international
18 volcanology organisations, positions on volcanology committees, volcanology awards and lead-
19 authorship on volcanology papers. The sparse demographic data available means our analysis
20 focuses mainly on gender identity discrimination, but we show that discrimination related to
21 ethnicity, sexual orientation, religion, physical ability and socio-economic background is also
22 occurring, with the intersection of these discriminations further exacerbating marginalisation within
23 the volcanology community. We share suggestions and recommendations from other disciplines on
24 how individuals, research groups and organisations can promote, develop, and implement new
25 initiatives to call out and tackle discrimination and advance EDI in the volcanological community.
26 There is a lot of potential for improvement if we all see our role in creating a more equitable, diverse
27 and inclusive volcanology community. This requires 1) Awareness: acknowledgement of the
28 problem, 2) Commitment: through the statement of EDI core values and the development of action
29 plans, codes of conducts, and guidelines, 3) Action: aiming for representation of all groups, and 4)
30 Reflection: development through critical self-reflection and a willingness to address shortcomings.

31 1. Introduction

32 There is a well-documented diversity crisis in geoscience (e.g. Dowey et al., 2021; Dutt, 2020;
33 Johnson, 2018; Marin-Spiotta et al., 2020), however no international study has yet focused on
34 equity, diversity and inclusion (EDI) in volcanology. Therefore, our intent is to collate and collect
35 new data, raise awareness about the experiences of members of our community, and recommend
36 how individuals and organisations should move EDI forwards in volcanology.

37 We present a review and analysis of diversity reflected by memberships of volcanology-themed
38 international organisations and groups, positions on prestigious committees, award winners, and
39 lead-authors of publications. We have also collated over 100 anonymous stories from volcanologists
40 and incorporate quotes from these throughout the text; these anecdotal and lived experiences
41 record what some volcanologists are saying about their discipline and collectively describe a culture
42 in volcanology that requires immediate change. Some accounts of witnessed and experienced
43 discrimination are harrowing, and some comments readers may find distressing or offensive. The
44 Supplementary Materials include summary information about the survey and how it was
45 distributed, full transcripts of the stories from survey participants and graphics detailing the
46 demographics of the respondents and their frequency of experienced or witnessed discrimination
47 in volcanology.

48 2. Who is the volcanology community?

49 To explore who the volcanology community is today, the only data available comes from
50 membership data collected by international organisations with a focus on volcanology (for data and
51 methods, see **Online Resources 1, 2 and 3**). We are limited by the categories these organisations

52 use to collect data on gender, and by the lack of data on other demographics and protected
53 characteristics¹.

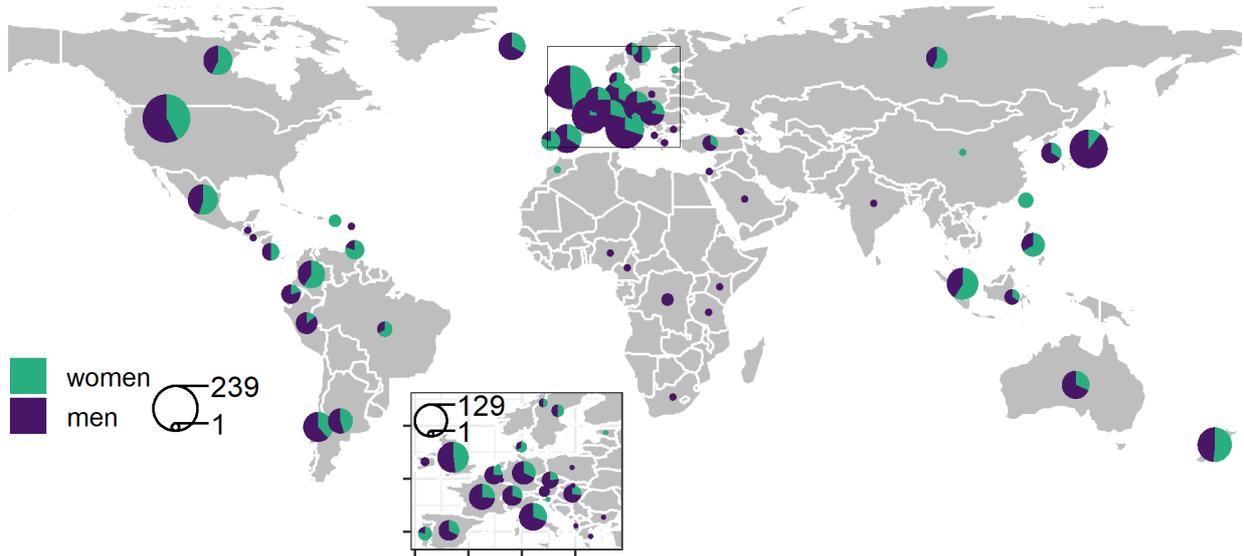
54 The International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) is part
55 of the International Union of Geodesy and Geophysics (IUGG) (Cas, 2022). Its organisational
56 structures, volcanology focus and international affiliation makes for an interesting comparison to
57 volcanology groups that are regional (Engwell et al., 2020) or only include some aspects of
58 volcanology, such as the American Geophysical Union (AGU) Volcanology, Geochemistry &
59 Petrology (VGP) Section or the European Geosciences Union (EGU) Geochemistry-Mineralogy-
60 Petrology-Volcanology (GMPV) Division.

61 The IAVCEI 2021 membership data reports only the geographical location of the membership and
62 the gender identity (either male or female must be selected during registration, **Figure 1**). In 2021
63 IAVCEI had 937 members (39% female, 61% male) across 62 countries (See **Table 1**). The
64 overwhelming majority of countries around the world have more men than women IAVCEI
65 members, and only three countries with >4 members have close to 50% women (the UK, New
66 Zealand and Mexico). A few countries have more women (e.g. Portugal, Denmark, the Philippines,
67 Taiwan, Singapore, Brazil, Russia and Canada), and some countries have notably high percentages
68 of men (e.g. Japan, South Korea, France, Ecuador and Peru). Across Africa, the Middle East and India
69 IAVCEI members are few, but all men).

¹ Whilst these vary by country, the international human rights legal framework contains international instruments to combat specific forms of discrimination, including [discrimination against indigenous peoples](#), [migrants](#), [minorities](#), [people with disabilities](#), [discrimination against women](#), [racial](#) and [religious discrimination](#), or [discrimination based on sexual orientation and gender identity](#).

IAVCEI membership and gender distribution in 2021

Points are coloured according to the gender distribution. The size denotes the total members, where the upper bound is the maximum total for a single country.



70

71 **Figure 1:** The number of IAVCEI members per country and pie charts showing the percentage of
72 women and men IAVCEI members in 2021. The inset map shows European countries in detail for
73 clarity.

	Membership	Female %	Male %	Nonbinary	Prefer self-describe	Unknown	Other	Prefer not to say
IAVCEI 2021	937	39%	61%	(-)	(-)	(-)	(-)	(-)
AGU VGP 2020	2919	31%	67%	3 (0.1%)	0 (0.0%)	42 (1.4%)	(-)	29 (1.0%)
AGU VGP 2020 ECR and Student*	1235 (42%)	46%	52%	2 (0.2%)	0 (0.0%)	7 (0.6%)	(-)	15 (1.2%)
AGU VGP 2020 Non-ECR and Non-Student*	1684 (58%)	20%	77%	1 (0.06%)	0 (0.0%)	35 (2.1%)	(-)	14 (0.8%)
EGU GMPV 2021	1365	39%	58%	(-)	(-)	14 (1.0%)	0 (0%)	27 (2.0%)
EGU GMPV 2021 ECS**	808 (59%)	44%	55%	(-)	(-)	6 (0.7%)	0 (0%)	7 (0.9%)
EGU GMPV 2021 Non ECS**	557 (41%)	31%	64%	(-)	(-)	8 (1.0%)	0 (0%)	20 (3.6%)

74 **Table 1:** Gender identity of members of volcanological groups in 2020/2021. Data for Early career researchers (ECR, including students) is also provided
75 in brackets where indicated: *AGU definition of Students plus Early Career Researchers, **EGU definition of Early Career Scientists, (-) indicates data
76 were not collected by the organisation. In all groups, there are a higher proportion of women in earlier career stages.

77 The EGU GMPV report the gender, career stage and geographic location of members from 2016-
78 2021. Since 2019, EGU has offered the option for members to select their gender as 'male', 'female',
79 'other' or 'prefer not to say'. There were 1365 EGU GMPV members in 2021 across 69 countries
80 (39% female, 59% male and 0% Other gender, see **Table 1** and **Figure S1a** in **Online Resource 1**). In
81 2021, the top five member countries were Germany, the UK, Italy, France and the USA (**Figure S2** in
82 **Online Resource 2**), and so the bulk statistics are strongly influenced by them. The global
83 distribution and proportion of the EGU GMPV Early Career Scientists (ECS) members has broadly
84 increased from 2016-2021 (**Figure S3** in **Online Resource 2**). Members joining from new countries,
85 such as Pakistan, Nigeria, Bulgaria, or Georgia, tended to be ECS (**Figure S2** in **Online Resource 2**).
86 During this time, there have been notable increases in the number of ECS members in, for example,
87 Japan, the Netherlands, Ireland, Hungary, Canada, Spain, Portugal, and Italy, but decreases in
88 Belgium and Sweden (**Figure S3** in **Online Resource 2**).

89 The AGU VGP provided us with the gender identity and geographical region data of its members
90 from 2013-2021 and their career stage up to 2020. AGU offers the option for members to select
91 their gender as 'male', 'female', 'non-binary', 'prefer to self-describe' or 'prefer not to say'. Since
92 2013, these data have remained relatively stable, despite absolute numbers declining over this
93 period (**Figure S4** in **Online Resource 2**). With 2919 members in 2020 (31% female, 67% male and
94 0.1% non-binary), the AGU VGP includes more individuals than the IAVCEI 2021 or EGU GMPV 2021
95 datasets (**Table 1**).

96 The AGU VGP section has a lower percentage of students and Early Career Researchers (ECR) than
97 the EGU GMPV ECS (42% compared to 59%, **Table 1**), but these groups have a similar gender balance
98 across the organisations. The AGU VGP student and ECR data and the EGU GMPV ECS data both
99 show that these groups have a higher proportion of women (46% and 44%, respectively) relative to
100 the overall membership, and the AGU data suggests that this has been the case since at least 2014

101 **(Table 1, Figure S5 in Online Resource 2).** The senior volcanologists (non-student, non-ECR, non-ECS
102 groups) have a particularly low female (19.7%, 31.2%) and high male (77.4%, 63.7%) proportion
103 relative to the AGU VGP and EGU GMPV bulk statistics. This suggest a loss of women volcanologists
104 with advancing career stage.

105 There are limitations to these data. Whilst IAVCEI, AGU and EGU are the largest international groups
106 that volcanology members can engage with, not all volcanologists are members. Other significant
107 volcanology organisations include the Latinamerican Association of Volcanology (Asociación
108 Latinoamericana de Volcanología, ALVO) that was founded in 2010 and aims to strengthen and
109 promote the ties among Latin American volcanologist; and several of their members may not be
110 IAVCEI, AGU or EGU members, and so are not represented in these datasets. The inauguration
111 workshop for IAVCEI's International Network for Volcanology Collaboration (INVOLC), which is
112 working to foster cross-country partnerships and overcome challenges related to access to
113 resources, was attended by many volcanologists from around the world who were not members of
114 IAVCEI (K. Fontijn, *pers comm.*). National volcanology-specific organisations or subject-specific sub-
115 groups of IAVCEI, such as IAVCEI Commissions, also have their own members, but generally do not
116 collect demographic data – however, collecting and publishing demographic data on their members
117 would be a great resource for the volcanology community, helping groups to identify opportunities
118 to increase diversity and be more inclusive.

119 The gender identity data currently available from IAVCEI is limited and is in urgent need of updating.
120 Currently, IAVCEI members can only select 'female' or 'male' during registration, erasing non-binary
121 and genderqueer scientists (Cameron and Stinson, 2019). It also does not allow for transgender
122 scientists to identify as such if they wish. Individuals should always have the option to self-identify
123 their gender in any demographics data collection (Strauss et al., 2021). Some volcanology
124 organisations don't see the need for them to collect such data:

125 *“no such data have ever [been] collected, practically as it was never really relevant to*
126 *anything we’ve done.” – an IAVCEI Commission Lead in response to our request for data*

127 However, the lack of data means that any EDI issues may not be known or recognised, and the
128 effectiveness of any actions put in place to improve EDI cannot be assessed. Recently some
129 volcanology organisations and groups have started to collect membership data during registration
130 to online events to learn about their members, for example prior to an IAVCEI Commission on
131 Volcanic and Igneous Plumbing Systems (VIPS) online seminar in 2021, and for the IAVCEI
132 Commission on the Chemistry of Volcanic Gases (CCVG) workshop in 2021. Other IAVCEI
133 Commission leads we contacted expressed a desire to understand better why such data collection
134 is needed, how this should be done responsibly and how data should be stored. Unfortunately, it is
135 not possible for us to provide a template for this as the appropriate data to collect, and the laws
136 which permit it to be collected, vary depending on geographical context. For example, in France it
137 is unlawful to collect data on race. However, in the UK Protected Characteristics data can be
138 collected under the Equality Act. Ultimately each organisation should be guided by the requirements
139 from their ‘host country’ (see **Online Resource 4** for some suggestions), but we also suggest that
140 the creation of a dedicated EDI role on the IAVCEI Committee would provide the community with a
141 go-to person that organisations and groups in volcanology could contact to discuss ethical and
142 lawful data collection methods and data storage.

143 3. Who publishes in volcanology journals?

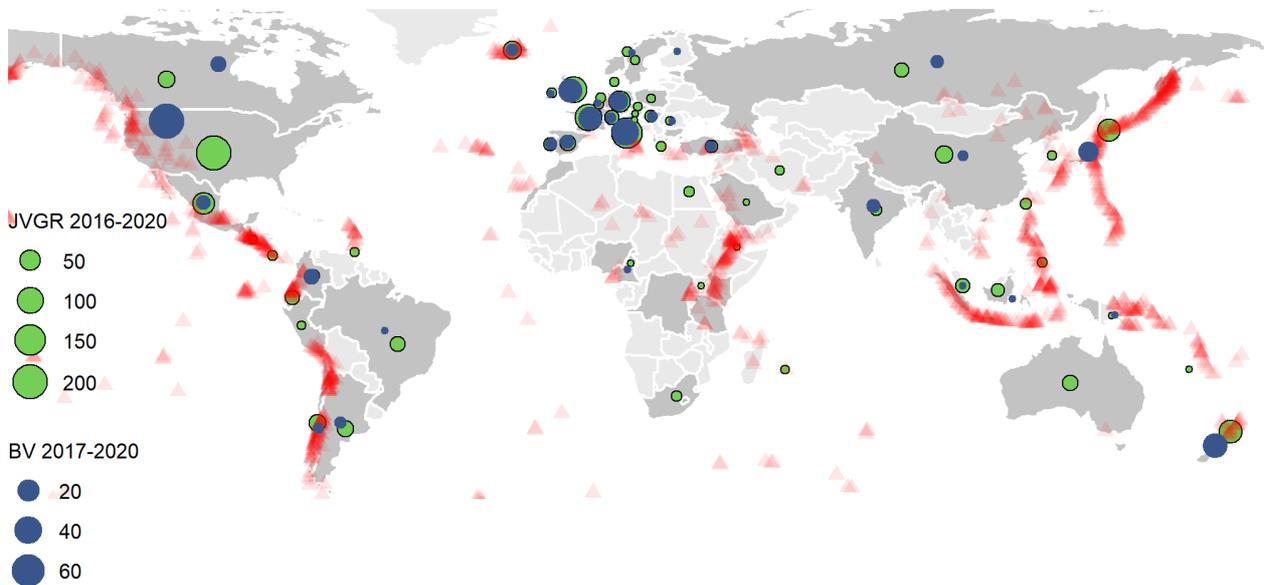
144 The advancement of knowledge in volcanology is communicated primarily through peer-reviewed
145 scientific publications, but a wealth of knowledge is also published in non-peer-reviewed eruptions
146 reports prepared by volcano observatories and information released through media outlets (Peltier
147 et al., 2022). Decisions about grant funding, postdoctoral appointments, and ultimately the ability
148 to pursue an academic career, is in part decided on an individual’s publication record. To understand

149 who is allowed to create and disseminate knowledge we analysed data from two of the most
150 important volcanology journals (Cas, 2022; Stevenson, 2014) - the Journal of Volcanology and
151 Geothermal Research (JVGR, Elsevier) and the Bulletin of Volcanology (Bull Volc, Springer). The
152 other volcanology-themed journals we approached either did not respond or were unable to
153 provide data. The only volcanology-specific journals we are aware of that are not currently only
154 published in English are the Bulletin of the Volcanological Society of Japan, which publishes in
155 Japanese with abstracts in English, and Volcanica which offers a dual-language abstract option. A
156 recent Volcanica special issue of Reports published full articles in English and in Spanish, done in
157 part due to recognition of language barriers in volcanology (Chevrel et al., 2021).

158 The Bull Volc and JVGR data show a lack of diversity in lead-author affiliation country. The lead-
159 authors of volcanology articles are most often from Europe, North America, New Zealand and Japan
160 (**Figure 2**). Regions with under-represented lead-author country affiliation and a higher rate of
161 rejection (**Figures S6 and S7**), despite high levels of volcanic activity, include South America, Central
162 America, East Africa and South-East Asia. This echoes similar trends observed in broad geoscience
163 publications (North et al., 2020) and may reflect a well-established bias in academic publishing
164 favouring the English-language (Ramírez-Castañeda, 2020) or a tendency for researchers from these
165 countries to not lead volcanology articles or instead produce non-peer-reviewed reports (Peltier et
166 al., 2022).

Recent publications in J. Volcanol. Geotherm. Res and Bull. Volcanol.

Red triangles denote Holocene eruptions. Countries with IAVCEI members are darker grey.



167

168 **Figure 2:** The total number and country of affiliation of lead-authors of articles accepted for
169 publication in volcanology journals in recent years. The location of IAVCEI members and volcanic
170 eruptions in the Holocene are shown for reference.

171 Our collated narratives reveal the different experiences of authors depending on the research
172 group's ethical practices and potential nepotism:

173 *"Not being given the chance to co-author a paper despite having spent significant time helping*
174 *out... I see others (both junior and senior folks) who contribute much less, sometimes hardly*
175 *anything, repeatedly being put on papers, which only results in reinforcing their status as a well-*
176 *known and/or promising researcher. This practice tends to happen in the inner circle of the big*
177 *volcano groups"*

178 Publication authorship should be based on contribution, and journals are increasingly asking for an
179 author contribution statement to be included with the article. However, in some research groups
180 there is a perception that some contributions are 'valued' more than others:

181 *"Women in volcanology are often 'forgotten' or their scientific contribution is devalued relative*
182 *to a male of similar career stage"*

183 A survey response suggests discrimination in publication authorship related to maternity leave:

184 *“I have been erased [from the] list of authors of papers I have written and [that] I have worked*
185 *for because I went on maternity leave”.*

186 4. Who decides what is published in volcanology?

187 One of the strongest voices in the publication of volcanology journal articles comes from the 120
188 senior editorial team and editorial board members of the leading volcanology journals: JVGR
189 (Elsevier), Bull Volc (Springer), the Journal of Applied Volcanology (JAV, Springer) and Volcanica (a
190 diamond open-access journal). We used the publicly available country of affiliation data (as of
191 February 2022) to look at the geographic distribution of the editors of these journals, finding that
192 63% (75/120) are affiliated to countries where English is recognised as (one of) the official
193 language(s): Australia, Ireland, New Zealand, Singapore, Trinidad, UK, USA, and a part of Canada.
194 The journal editor team (senior editors and editorial board members) have a lot of influence in the
195 publication process and may be able to solicit guest editors, solicit research articles, propose
196 thematic Special Issues, and they ultimately decide whether a paper is accepted or rejected.
197 Editorial teams may also have a role developing and implementing the journals code of conduct that
198 authors, reviewers and editors are required to adhere to. Explicit (or unconscious) bias against the
199 authors, the reviewers, or the editor may play a part in decisions the editors make (e.g. Fox and
200 Paine, 2019; Hagan et al., 2020; Helmer et al., 2017; Poulson-Ellestad et al., 2020) and how these
201 decisions are received. One editor wrote:

202 *“It seems clear that some authors and reviewers find it harder to respect my decision (or me?)*
203 *than they would if I were a man.”*

204 We are not aware of any volcanology Journals that ask for information on protected characteristics
205 of their authors or reviewers (and often not their editors either) and so we have found there is no
206 data available to assess the contribution of different genders to volcanology articles. We emailed

207 the 120 volcanology editors of Bull Volc, JAV, JVGR and Volcanica and asked them to complete a
208 quick survey to tell us their gender identity, to confirm which journals they are editor, how many
209 years since completing their PhD, whether or not they consider themselves to be an early career
210 researcher (ECR), and whether they are an English native speaker. We had a 79% response to our
211 survey (see Table 2 for a summary), with 6 individuals being involved in editing two of the journals
212 listed. When no response was given, we used internet searches to gather publicly available
213 information on gender identity, career stage and native language.

214 There are more men than women in senior volcanology editorial positions and editorial boards
215 (mostly >60% men), except for the editorial board of Volcanica (43% men) and the editor-in-chief of
216 JAV (a woman). Volcanica is the only volcanology journal which has early career researchers in the
217 senior editorial committee, and it has a much larger proportion of ECRs in its editorial board (51%
218 ECR) compared to the other volcanology journals (these have ~10% ECRs). The journals with the
219 higher proportion of men in the editorial team (Bull Volc and JVGR) tend to have a lower proportion
220 of native English speakers (<50%). JAV and Volcanica have a relatively high proportions of women
221 editors and have a relatively high proportion of English native speakers (>70%). These editorial team
222 trends appear to broadly mimic the gender balance of IAVCEI members around the world (**Figure 1,**
223 **Table 1**), and suggests that non-native English speaking women are particularly underrepresented
224 in volcanology editor teams.

225 Publishers, Journals and editorial teams have a responsibility to act and address these issues (Mehta
226 et al., 2020), and to ensure that actions put in place to increase geographic representation, for
227 example, do not come at the expense of other important factors, such as gender balance (and vice
228 versa). Publishers are now actively discussing how they can make their journals more inclusive, and
229 new policies such as supporting the inclusion of trans scholars, introducing no restrictions on the
230 number of equally contributing and corresponding author numbers, deciding how authors can
231 choose to display their preferred pronouns, and a push to use more inclusive language, are all

232 positive steps. However, pressure needs to come from those who have a voice in the system to push
 233 for more rapid change across the sector, to educate editors, authors and reviewers as to why it is
 234 needed, and to continue to evolve in a positive direction.

Journal and Role	Total number	Self-declared gender identity (M/F/TrM/TrF/nb/P/na)	Men:Women	% ECR	% English native speaker
<i>Bulletin of Volcanology</i>					
Executive director and Deputy editor	3	2/0/0/0/0/0/1 (66% response)	2:1 (66% M)	0%	33%
Associate editor	26	13/5/0/0/0/1/7 (73% response)	19:7 (73% M)	12%	42%
<i>Journal of Applied Volcanology</i>					
Editor-in-chief	1	0/1/0/0/0/0/0 (100% response)	0:1 (0% M)	0%	100%
Editors	11	5/4/0/0/0/0/2 (82% response)	6:5 (50% M)	9%	73%
<i>Journal of Volcanology & Geothermal Research</i>					
Co-editor in chief	6	3/2/0/0/0/0/1 (83% response)	4:2 (67% M)	0%	50%
Editorial Board	32	14/8/0/0/0/0/10 (69% response)	22:10 (69% M)	9%	50%
<i>Volcanica</i>					
Editorial committee	8	5/3/0/0/0/0/0 (100% response)	5:3 (63% M)	50%	75%
Editorial board (+)	35	13/18/0/0/0/0/4 (89% response)	15:20 (43% M)	51%	77%

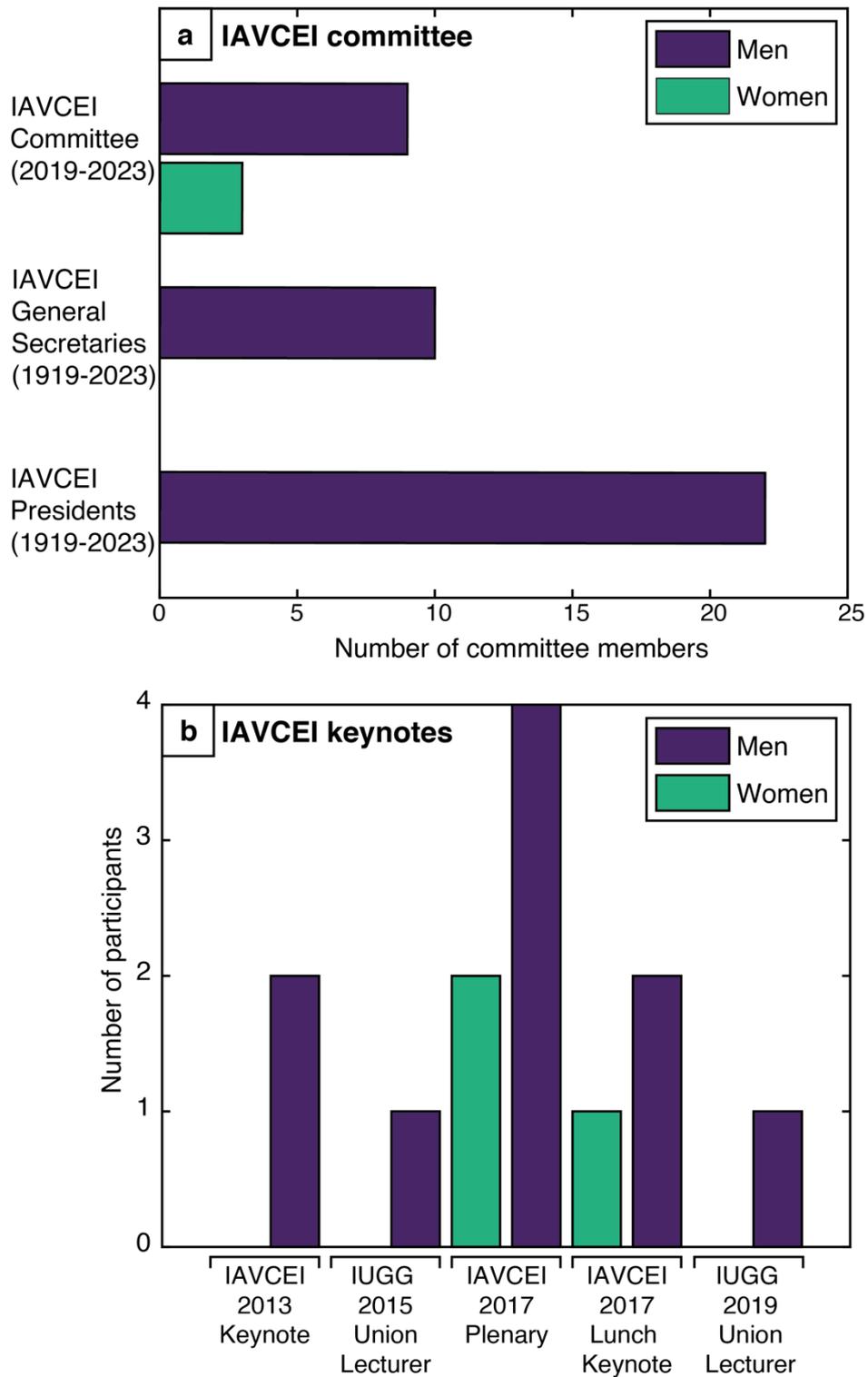
235 **Table 2:** Characteristics of the editorial teams leading the main volcanology journals (February
 236 2022). The reported gender identity data was provided to us by individuals, and participants could
 237 select Male (M), Female (F), trans Male (TrM), trans Female (TrF), non-binary (nb) and Prefer not to
 238 say (P). The number of non-responders is indicated (na). Early career researchers are self-
 239 identifying, and in the absence of information or ambiguity we classified those who have had their
 240 PhD for ten years or less as ECRs. The reported ratio of men to women, the percentage of early
 241 career researchers and percentage of native English speakers includes data for non-responders
 242 collected through internet searches. Six individuals are editors for two of the journals. (+) includes

243 four technical team members and one Report editor (total 4 women and 1 man) who are all ECR
244 and all English native speakers. (-) includes one editor-in-chief.

245 5. Who leads our community?

246 *"I feel that in volcanology there is a male-dominated culture, and this is reflected in many of the*
247 *'leaders' such as award-winners or leads of committees like IAVCEI [being] male. It's really hard*
248 *to find diverse role models."*

249 The gender and racial identity of individuals holding many key IAVCEI leadership roles since its
250 inception in 1919 supports this assertion. A recent review article on the history of IAVCEI (Cas, 2022)
251 shows how women have been almost invisible in volcanology (photographs collated by Cas (2022)
252 shows the individuals who have taken key IAVCEI roles – 4 key personnel in the formation of IAVCEI,
253 22 Presidents, 10 secretaries, 11 Editors of Bull Volc – are all men). Women are under-represented
254 in the IAVCEI Committee relative to their proportion in the IAVCEI, AGU VGP and EGU GMPV
255 membership. The current IAVCEI Committee comprises nine (75%) men and three (25%) women
256 (see **Figure 3a**) and currently has relatively good representation from IAVCEI member countries
257 around the world (**Figure S9** and **Online Resource 2**). Over more than 100 years, up to today, 100%
258 of the IAVCEI General Secretaries and 100% of IAVCEI Presidents have been men (**Figure 3a**), and
259 only once has the President been affiliated with a southern hemisphere country (**Figure S9**). IAVCEI
260 is unique amongst the eight scientific Associations within IUGG in never having had a woman or
261 non-binary President.



262

263 **Figure 3:** Gender identity of **a)** IAVCEI Committee leadership and members since 1919, and **b)**
 264 keynote speakers at IAVCEI General Assemblies, since 2013.

265 IAVCEI Commissions and Network board officers are slightly more diverse in gender than the IAVCEI
 266 Committee, comprising overall 63% men and 37% women. This gender balance is not evenly
 267 distributed: Nine out of seventeen IAVCEI Commissions (mostly inter-associations ones) have a

268 100% male board, five IAVCEI Commissions or Networks (including the ECR Network) have 50% men
269 and 50% women on their boards, and one IAVCEI Commission board is 100% women. Women lead
270 seven out of seventeen (40%) of IAVCEI Commissions, two out of seven (29%) inter-Association
271 Commissions and two out of two (100%) of IAVCEI Networks. The newer or ECR-focused IAVCEI
272 Commissions or Networks, or those that have regular changes in their leadership, tend to have more
273 gender equity or to be led by women, and this suggests gradual progress towards gender equity in
274 the IAVCEI Commissions.

275 In the IAVCEI 2013 General Assembly, and the IUGG 2015 and 2019 conferences, Union Lecturers
276 were 100% men. At IAVCEI 2017 there were 33% Plenary and Lunch keynote talks by women (**Figure**
277 **3b**), and the only instance of a woman giving a Plenary/Keynote was when there were a series of
278 different kinds of plenary talks at the conference. The country of affiliation of keynote speakers
279 often aligns with the country where the meeting is held. For example, in 2017 when the IAVCEI
280 general assembly was in Portland, Oregon, 8 out of nine keynote talks were from scientists with a
281 US-affiliation, and in 2013 when the IAVCEI general assembly was in Kagoshima both keynote
282 speakers had a Japanese affiliation. The issue of women and under-represented minorities giving
283 fewer talks is recognised broadly across Earth Science conferences (Ford et al., 2019).

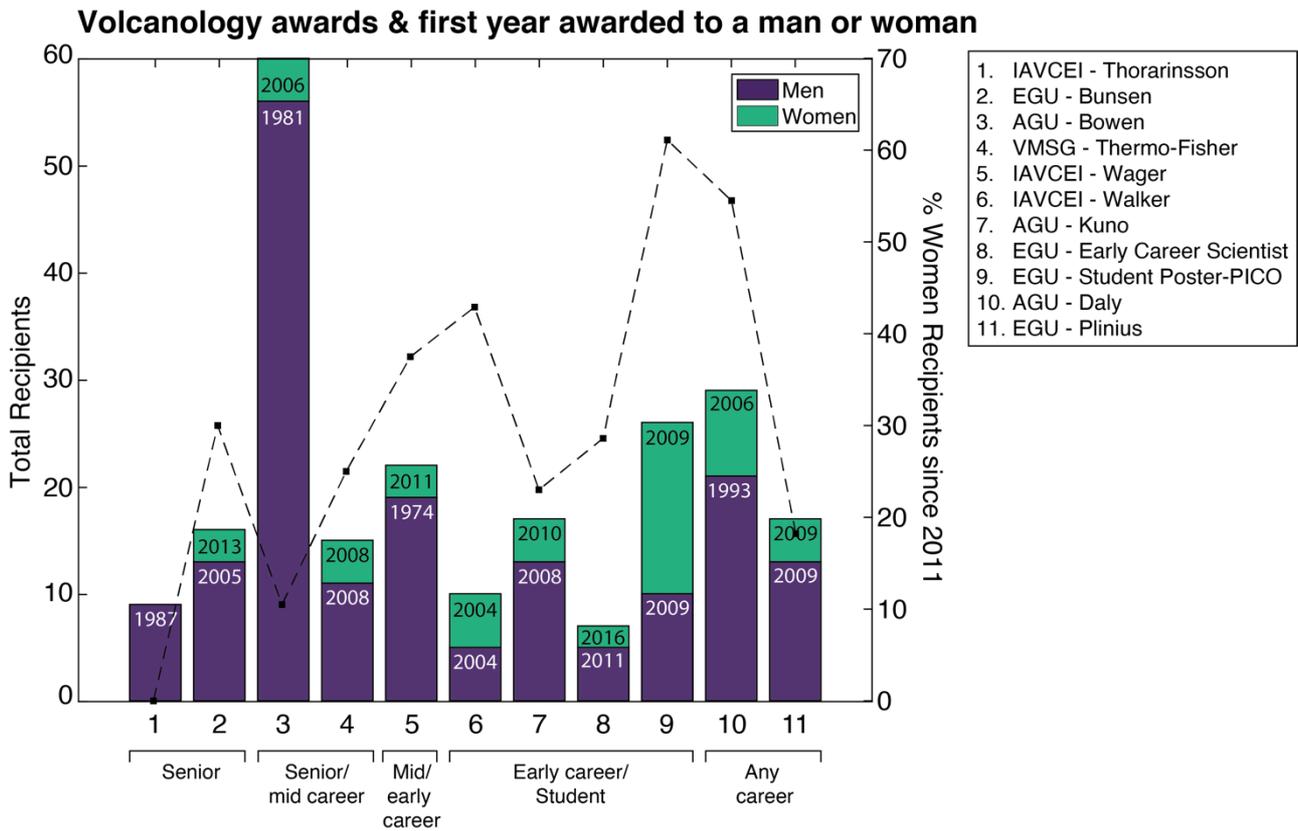
284 6. Who do we reward?

285 One way in which excellence in volcanology is recognised and celebrated is through awards and
286 medals. Award winners are role models and are implicitly perceived as reflecting the values that
287 volcanologists wish to promote.

288 The IAVCEI Thorarinson medal for senior volcanologists has never had a woman recipient. The
289 awards that individuals from all career stages are eligible for also have relatively low women
290 recipients (e.g. 5% women recipients of the AGU Bowen Award since 1981), whereas the early

291 career stage awards are much more balanced in gender (e.g. 50% women recipients of the IAVCEI
292 George Walker Award since 2004). The EGU award for students is unique in having a higher
293 proportion of women recipients. The proportion of women award recipients decreases the more
294 senior the medal in volcanology is (**Figure 4**) and the affiliation countries of all IAVCEI Thorarinson,
295 Wager and Walker award winners are exclusively restricted to the northern hemisphere, with the
296 most southerly country being Singapore (**Figure S8 in Online Resource 2**). There are fewer women
297 at the senior level in volcanology who would be eligible for these awards (e.g. **Table 1**) and fewer
298 IAVCEI members in the southern hemisphere, but the fact that we do not see women or individuals
299 affiliated with southern hemisphere countries receiving senior awards sends a message to the
300 younger generation that there is a narrow vision of what success looks like, and that the
301 contributions of women and other underrepresented people are not valued.

302 Recent trends show little improvement. Over the past ten years, the percentage of women
303 awardees ranges from 0-61% depending on the award category, and the more senior awards are
304 associated with lower percentages of women awardees i.e. 0% for the IAVCEI Thorarinson Medal,
305 30% for the EGU Bunsen Medal and 10.5% for the AGU Bowen Award (**Figure 4, Table S1 in Online**
306 **Resource 1**). These percentages are low relative to the likely proportion of non-ECR women in the
307 volcanology community (**Table 1**), suggesting that senior women in academia win senior awards less
308 frequently than their male counterparts. Over the past five years (2016 to 2021), in all cases there
309 has been a small increase in women award winners (**Table S1 in Online Resource 1**). Overall, this
310 demonstrates that the Matilda effect (where the scientific efforts and achievements of women do
311 not receive the same recognition as men) is present within the volcanology community (Lincoln et
312 al., 2012).



313

314 **Figure 4:** Gender identity of volcanology award winners for different career stages since the first
 315 year of data availability (bars), and the proportion of women recipients since 2011 (dashed line).
 316 The lower label on the bars indicates the first year of data availability and the upper label the first
 317 year there was a woman recipient.

318 A recent analysis conducted by the UK’s Volcanic and Magmatic Studies Group (VMSG) showed that
 319 men were nominated far more frequently than women for their most-senior award, the Thermo-
 320 Fisher Award, but when women were nominated, they tended to be more successful (VMSG
 321 Website newsletter #50 <https://vmsg.org.uk/>). Since 2010, there have been 79% men and 21%
 322 women VMSG Thermo-Fisher Award winners, for which VMSG received 83% men and 17% women
 323 nominations. It appears that only outstanding women tend to be nominated for this award. Despite
 324 comparable quality of work, women are under-recognised by our awards, and men over-
 325 represented.

326 A common challenge for awards committees is ensuring nominations come in at all, and the
 327 selection committees can only choose from those who are nominated (McFadden, 2018). In a bold
 328 move which has helped to raise awareness, the AGU Cryosphere Section declined to recommend

329 any nominees to the AGU Union Fellows committee in 2021 due to lack of diversity in the pool
330 (Cryosphere Fellows Selection Committee, 2021). Perhaps other organisations also need to follow
331 suit, or adopt an action plan (Ali et al., 2021), for what to do if/when a dramatically unbalanced
332 nomination pool arises. The ambition must be that outstanding researchers will be nominated for
333 awards, irrespective of their gender identity, status, socio-economic background, sexuality,
334 ethnicity, etc., and yet the data we have accessed suggests that volcanology is far from realising
335 this.

336 7. Experiences of discrimination in volcanology

337 The lack of diversity in volcanology highlighted by our analysis reflects ingrained discriminations that
338 affect the whole of society. Some of the comments received in our survey indicate that some
339 volcanologists do not feel included:

340 *“For my specific subdiscipline, at least in my country, it feels like it's a club where you have*
341 *to know the 'right' people, act the "right" way, work on the 'right' topics, etc. to be included*
342 *in it. Sometimes I think it's simply due an unconscious preference for "people like me"”*

343 Another theme that emerges seems to relate to harassment by superiors and power struggle in the
344 workplace, with fear of retribution through career detriment. The first step toward an inclusive, fair,
345 more diverse, and therefore more creative volcanology community is the awareness and
346 acknowledgement of the issues (e.g. Berhe et al., 2022; Keashly and Neuman, 2010; McKay et al.,
347 2008).

348 We received over 128 responses to our ethics-approved survey (see Supplementary Materials for
349 details on our methodology, the questions asked, geographic reach of our survey and the protected
350 characteristics of respondents). Discrimination means treating someone unfairly because of who
351 they are based on characteristics such as: age, disability, gender identity, pregnancy and maternity,

352 ethnicity, religion or belief, sexual orientation, socio-economic status, profession/job status. Overall
353 85 respondents (66%) reported experiencing discrimination and 104 respondents (82%) reported
354 witnessing discrimination in their volcanology work or study. From those who reported experiencing
355 discrimination, 55 (43%) reported that this happened a few times per year or more, and four
356 respondents reported constant discrimination (daily). Some individuals provided free-text
357 comments to describe instances of discrimination witnessed or experienced during their
358 volcanology studies or work (see Supplementary Materials). We have categorised these into 43
359 experiences and 23 witnessed accounts of discrimination, with the most common reported forms
360 of discrimination relating to sexism (reported 35 times), activities during fieldwork (16 times), a toxic
361 culture (10 times) and racism (9 times) (see **Figure 5**).



362
363 **Figure 5:** Word cloud of categories of volcanologists' experiences and witnessed accounts of
364 discrimination in their work or study reported in our survey (see Supplementary Materials for full
365 transcripts).

366 In an EDI debate at the virtual European Geophysical Union General Assembly in 2021, it was
367 stressed that responsibility for change should not be taken only by members of under-represented
368 groups or those who have experienced discrimination; not only because these members are often
369 not in a position of power, but mostly because the load of taking action should be fairly distributed.
370 The impact of discriminatory experiences against, or witnessed by, individuals can be profound, and
371 could lead to mental health problems and victims potentially leaving the field of volcanology.

372 Achieving a fairer and less discriminatory volcanology community is the responsibility of all its
373 members, and the work involved in this should be appropriately recognised and not fall exclusively
374 on those who are marginalised (Gewin, 2020).

375 8. Equity, Diversity, and Inclusion in volcanology: Looking forwards

376 Our view of the future of volcanology is of a community that makes all its members feel welcomed
377 and respected, and where all scientists can thrive. The rather sobering current state of equity,
378 diversity and inclusion (EDI) within the volcanology community presented in this contribution should
379 be a call to action for organisations, scientific journals, and individuals. A number of studies have
380 recently constructed evidenced-based action lists to address the lack of diversity in geoscience
381 which can be used as road maps (e.g. Ali et al., 2021; Dowe et al., 2021; Kaaden et al., 2021; Núñez
382 et al., 2020).

383 We thus conclude with four core recommendations to overcome ongoing and future EDI challenges.

384 1. **Awareness:** *Any change must be preceded by acknowledging the problem.* Inequities in
385 science, technology, engineering and mathematics (STEM) research fields are well
386 established in the literature (e.g. Clancy et al., 2014; Dutt, 2020; Fox and Paine, 2019; Lincoln
387 et al., 2012). The data presented here also proves that these issues are endemic in
388 volcanology, however, our analysis has been hampered by a lack of quality data. We thus
389 encourage volcanological organisations and journals to implement and/or continue to
390 develop measures to map out their current state of EDI so as to be aware of their specific
391 situation, and to take counteractive measures if necessary. This includes, for example, the
392 collection of quantitative (but anonymous) demographic data on society members,
393 conference/event participants, authors, editor groups, and reviewers. This, of course, must
394 be done using best practice for inclusive data collection (**Online Resource 4**) and also be

395 open to collecting anonymous feedback regarding EDI issues, and/or opportunities to discuss
396 EDI should be provided. Several of the committees we contacted expressed a strong desire
397 to be proactive in EDI but felt uncomfortable collecting protected data from their members.
398 We this suggest that EDI-dedicated roles be created on the IAVCEI Committee who can
399 oversee and advise on data collection, storage and collection so that the effectiveness of
400 actions can be measured.

401 2. **Commitment:** *Organisations and organisers should openly commit to EDI as core values and*
402 *develop action plans, codes of conducts, and guidelines.* Field experience can be
403 uncomfortable for women and for other under-represented groups due to a pervasive
404 macho culture, a lack of access to toilets, and unsafe environments for people of colour
405 (Anadu et al., 2020) or the lesbian, gay, bi, transgender, queer (or questioning), and others
406 (LGBTQ+) community (Olcott and Downen, 2020). However, a series of measures can be
407 implemented by field leaders to make fieldwork and field trips enjoyable and productive for
408 all (Greene et al., 2021; Lawrence and Dowey, 2021). Many scientific associations have codes
409 of conduct and guidelines for events, including workshops and conferences (e.g.
410 <https://vmsg.org.uk/events/code-of-conduct-for-meetings/>). We call for all volcanological
411 associations and commissions to follow suit, and for all volcanologists to follow these
412 guidelines. We need a zero-tolerance community regarding discrimination, disparaging
413 comments, and all forms of micro-aggressions occurring during volcanology events (e.g.
414 fieldtrips, conferences and workshops). Crucially, organisations need to have a clear,
415 transparent and confidential reporting structure in place, with a Code of Conduct in place so
416 that staff and students feel safe when reporting any incidents or acts of harassment or
417 bullying.

418 3. **Action:** *Organisations, journals, and conference organisers should aim for representation of*
419 *all groups among their members in their decision making.* Training regarding unconscious

420 bias and how to improve EDI should be a requirement for all members of organizational
421 leaderships, editorial boards, grant review panels, prize juries, and conference organizing
422 panels. At the same time, the effectiveness of these actions also needs to be monitored, and
423 specific additional training should be available, for example, in the form of bystander training
424 or anti-racism training. Nomination procedures for awards and prizes should be made more
425 inclusive by allowing anonymised nominations and pro-actively seeking diverse
426 nominations; the community needs to reflect on the purpose of awards and how they are
427 used. Organisations and conference organisers should provide visibility to diverse role
428 models. Ongoing initiatives amongst publishing houses and journal editor boards to address
429 equality is a new focus and leading to the development of new Editorial policies through the
430 review of procedures and standards. The role of an editor is multifaceted, and one element
431 should be attention to EDI.

432 4. **Reflection:** *Critical self-reflection and a willingness to address shortcomings should be part*
433 *of everyone's development (Dutt, 2021).*

434 There is clearly a lot of potential for improvement if we all see our role as one of creating a more
435 equitable, diverse and inclusive volcanology community. Some pro-active initiatives to improve EDI
436 are beginning to be put in place, and responding to the findings given here, as well as
437 implementation of initiatives following our recommendations, should improve the situation over
438 the coming decade. However, it will be through the systematic and sympathetic collection and
439 analysis of data, and by listening to the voices of individual volcanologists and the volcanology
440 community, that the impact of these initiatives will be known.

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450 The use of survey data collected as part of this study is approved by a Research Ethics assessment
451 (#2093) completed by Cambridge University's Department of Geography Ethics Review Group.

452 10. Abbreviations and acronyms

453 AGU VGP – American Geophysical Union Volcanology, Geochemistry and Petrology section
454 ALVO - Asociación Latinoamericana de Volcanología
455 Bull Volc – Bulletin of Volcanology
456 ECR – Early Career Researcher
457 ECS – Early Career Scientist
458 EDI – Equity, diversity and inclusion
459 EGU GMPV – European Geosciences Union Division on Geochemistry, Mineralogy, Petrology and
460 Volcanology
461 IAVCEI – International Association of Volcanology and Chemistry of the Earth's Interior
462 INVOLC - IAVCEI's International Network for Volcanology Collaboration
463 IUGG – The International Union of Geodesy and Geophysics
464 JAV – Journal of Applied Volcanology
465 JVGR – Journal of Volcanology and Geothermal Research
466 LGBTQ+ - lesbian, gay, bisexual, transgender, queer (or questioning), and others
467 STEM – Science, Technology, Engineering and Mathematics
468 VMSG – Volcanic and Magmatic Studies Group
469

470 **Declaration of Compliance with Ethical Standards**

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473 Conflict of Interest: The authors declare no conflict of interests.

474 Ethical approval: The use of survey data collected as part of this study is approved by a Research

475 Ethics assessment (#2093) completed by Cambridge University's Department of Geography Ethics

476 Review Group. Data was collected anonymously through a Google Form, released 30th September

477 2021 and closed 3rd November 2021. Participants had to confirm consent agreement (tick box), and

478 that respondents understood: (1) that the participation is voluntary; (2) that data withdrawal is

479 possible up to a month after the survey closes; (3) to which end the information will be processed;

480 (4) that the information will be handled in accordance with the terms of the General Data Protection

481 Regulation 2016/679; (5) that the information provided may be subject to review by responsible

482 individuals from the University for monitoring and audit purposes. All data is stored securely on a

483 password-protected cloud storage, accessible only by the researchers, in an anonymised state

484 (regardless of the participants choice whether or not to be anonymous with any personal identifying

485 details stored in a separate file) and data will be destroyed after 10 years (01/09/2031).

486 Informed consent: All survey participants provided data anonymously.

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591

Online Resources

1. Online Resource 1 – Supplementary Tables

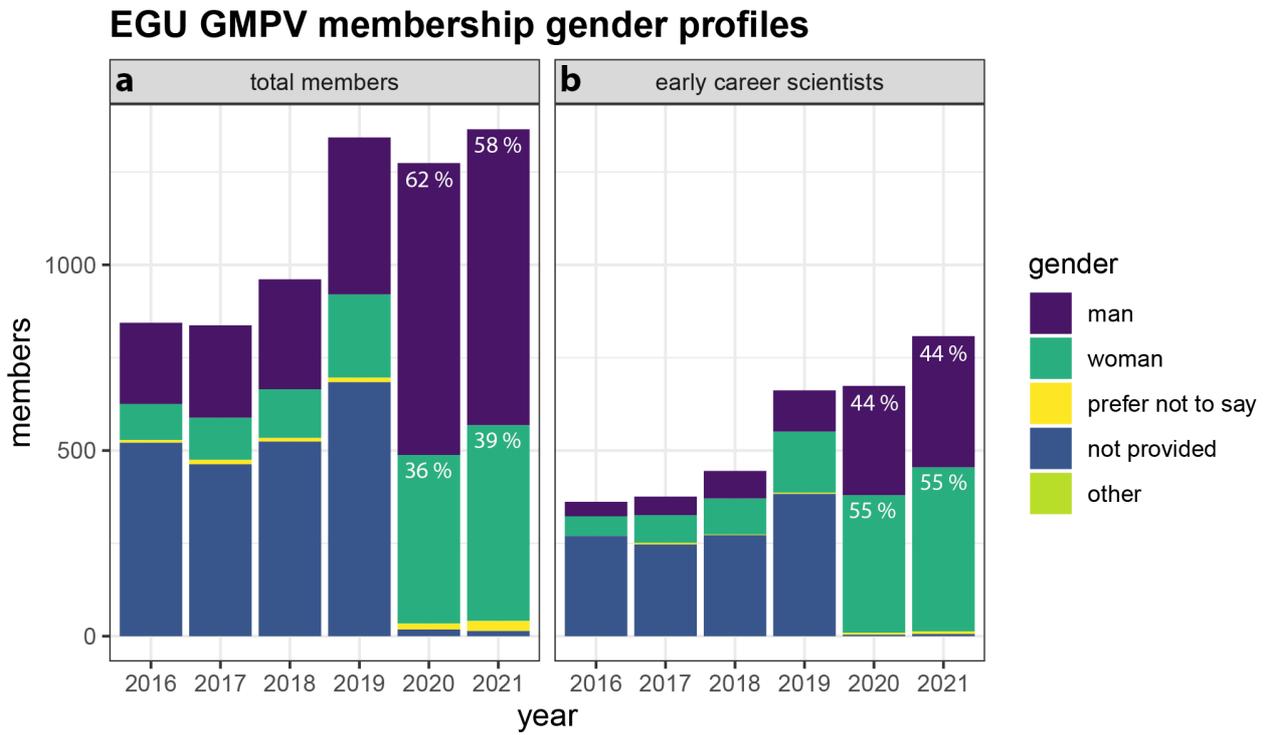
Award	Career stage	Reporting period	Frequency of award	Number of Men	Number of Women	First year of a Woman recipient	% Women since 2011	% Women since 2016
IAVCEI - Thorarinsson Medal	Senior	1987-2017	Every 4 years	9	0	N/A	0	0
EGU (GMPV) - Robert Wilhelm Bunsen Medal	Senior	2005-2021	Every year	13	3	2013	30%	33.3%
AGU - The Norman L. Bowen Award	Mid- or senior career	1981-2021	Every year	56	4	2006	10.5%	18.2%
VMSG - Thermo-Fisher Award	Mid- or senior career	2008-2021	Every year	11	4	2008	25%	33.3%
IAVCEI - Wager Medal	Early and mid-career, up to 15 years post PhD	1974-2019	Every 2 years	19	3	2011	37.5%	-
IAVCEI - George Walker Award	Early career, up to 7 years post PhD	2004-2019	Every 2 years	5	5	2004	42.9%	-

AGU - The Hisashi Kuno Award	Early career	2008-2021	Every year	13	4	2010	23%	25%
EGU (GMPV) - Division Outstanding Early Career Scientist Award	Early career	2011*-2021	Every year	5	2	2016	28.6%	40%
EGU (GMPV) - Outstanding Student Poster and PICO (OSPP) Award	Early career	2009-2019	Every year	10	16	2009	61.1%	-
AGU - The Reginald Daly Lecture	All career stages	1993-2021	Every year	21	8	2006	54.5%	66.7%
EGU (Natural Hazards Division) - Plinius Medal	All career stages (2004–2011 early career scientists only)	2004-2021	Every year	13	4	2009	18.2%	33.3%

Table S1: Volcanology awards for different career stages, and the first year that it was awarded to a woman. The percentage of women recipients since 2011 is provided, and since 2016 for awards given yearly up to 2021. *Award not given from 2012-2014.

1 2. Online Resource 2 – Supplementary Figures

2



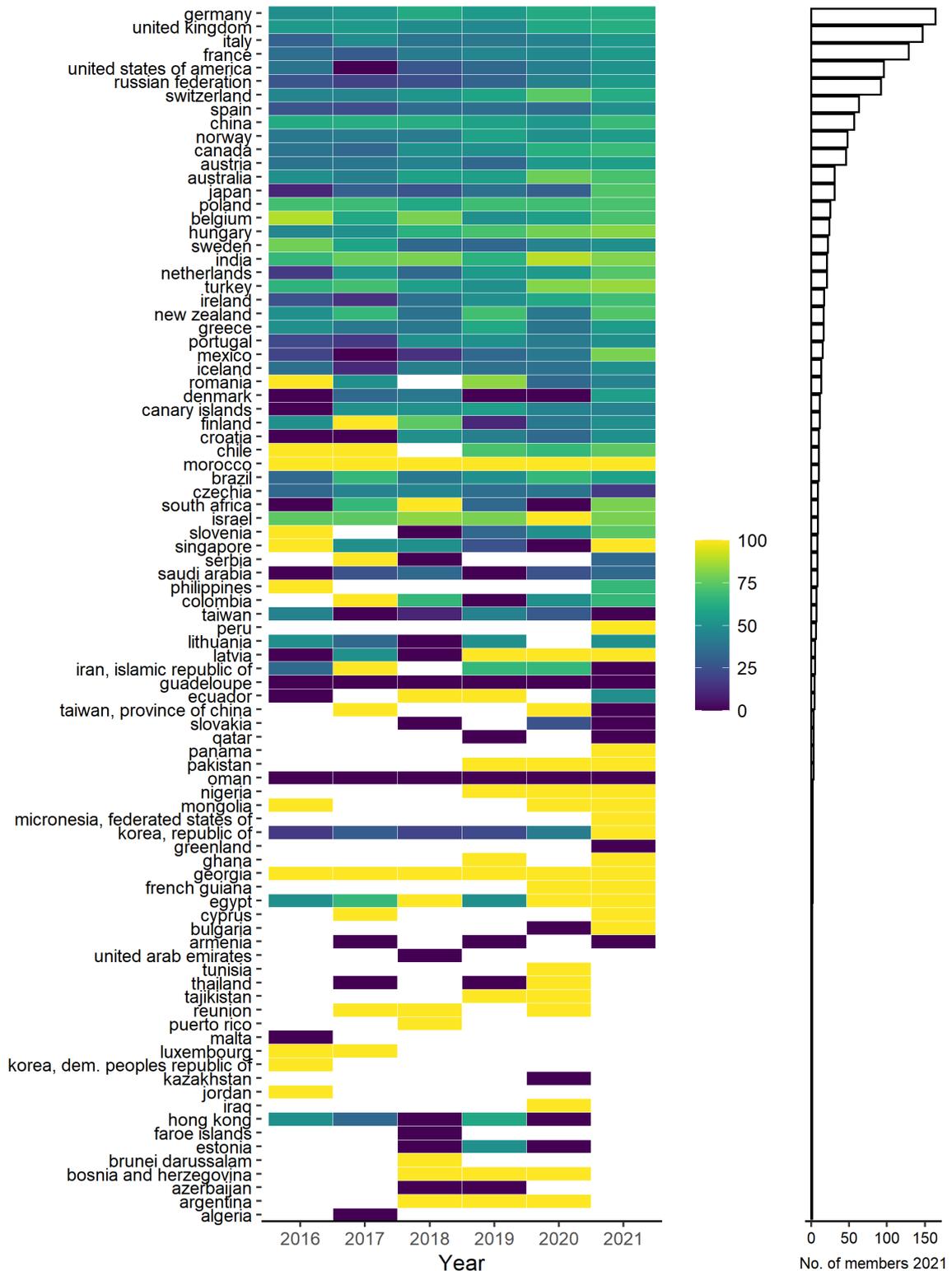
3

4 **Figure S1:** Gender identity of a) total number of EGU GMPV members, and b) Early Career Scientists
5 from 2016 to 2021.

6

Memberships to EGU GMPV from 2016 - 2021

The heatmap represents the % of members that are early career scientists.
 Countries are ordered by the total number of members in 2021.
 Bars on the right represent the total no. of members in 2021.

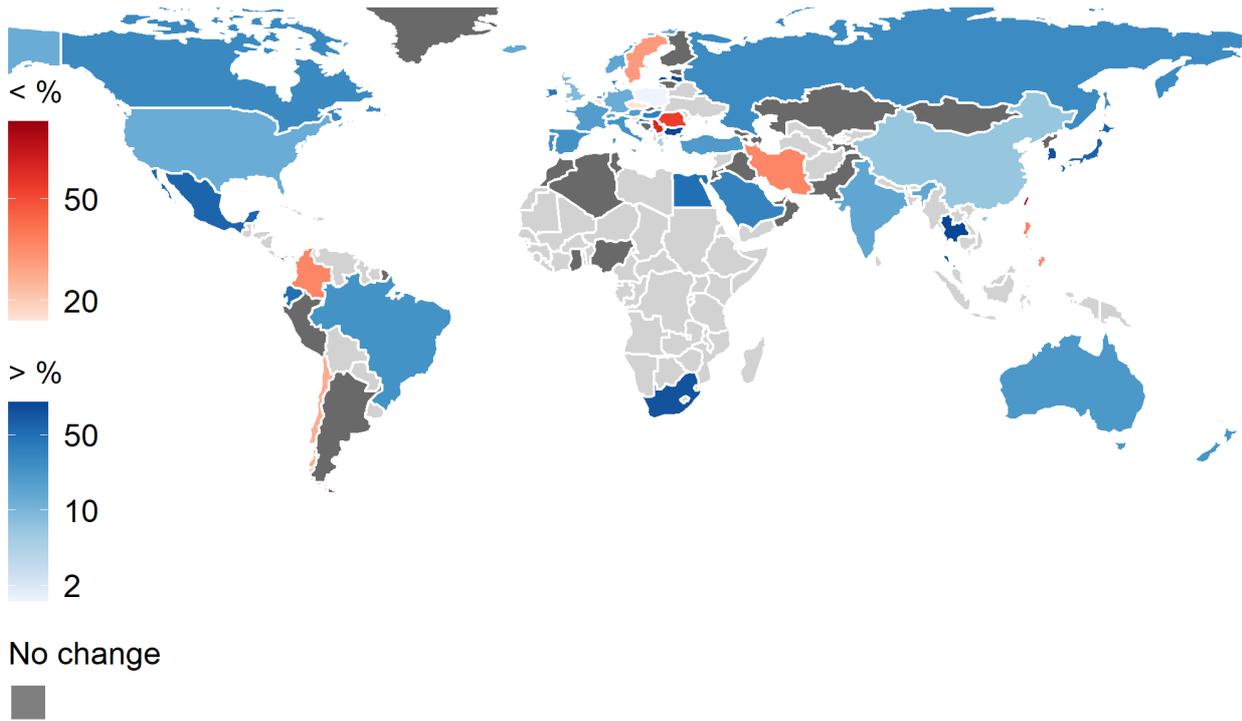


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Figure S2: Total number and proportion of Early Career Scientists per country of EGU GMPV members from 2016 to 2021.

Change in % of ECS members of EGU GMPV, between 2016 - 2021

Blue shades represent the increase in % of ECS members
Red shades represent the decrease in % of ECS members
Grey indicates no change



12
13 **Figure S3:** Change in % of Early Career Scientists of EGU GMPV from 2016 to 2021.

14

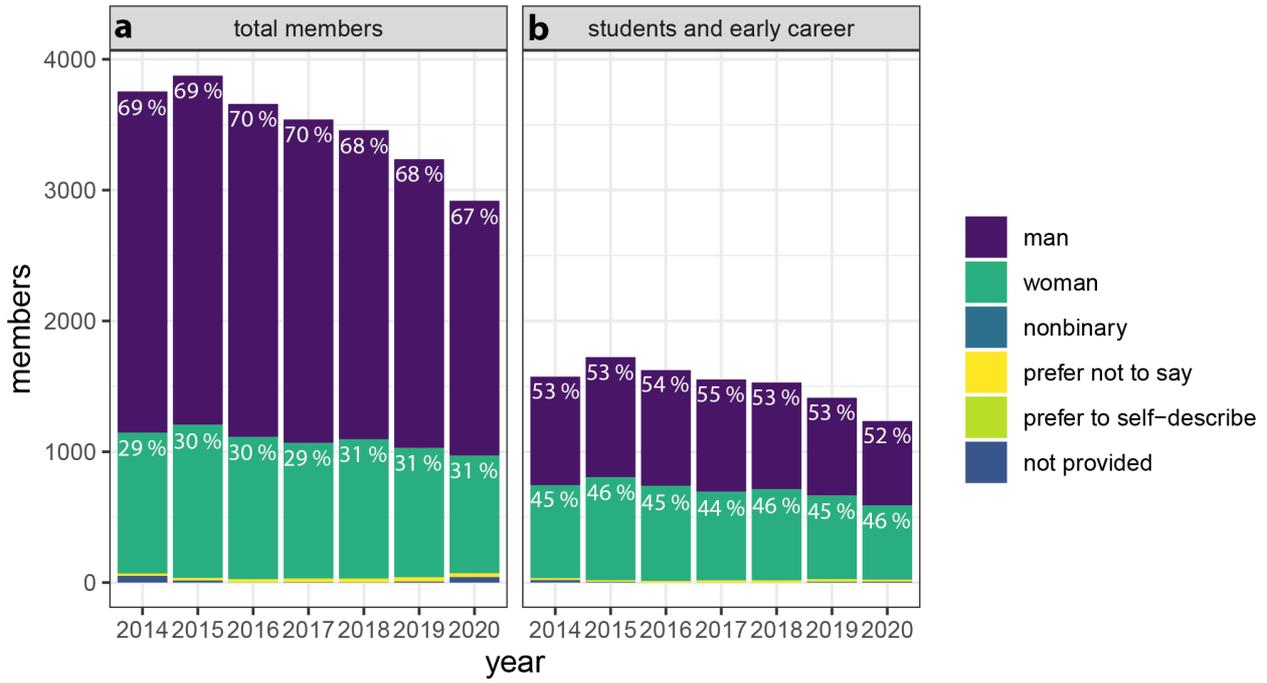


15

16 **Figure S4:** AGU VGP membership from 2013 to 2021: a) gender identity, b) Career Stage and c)
 17 Geographic Region.

18

AGU VGP membership gender profiles



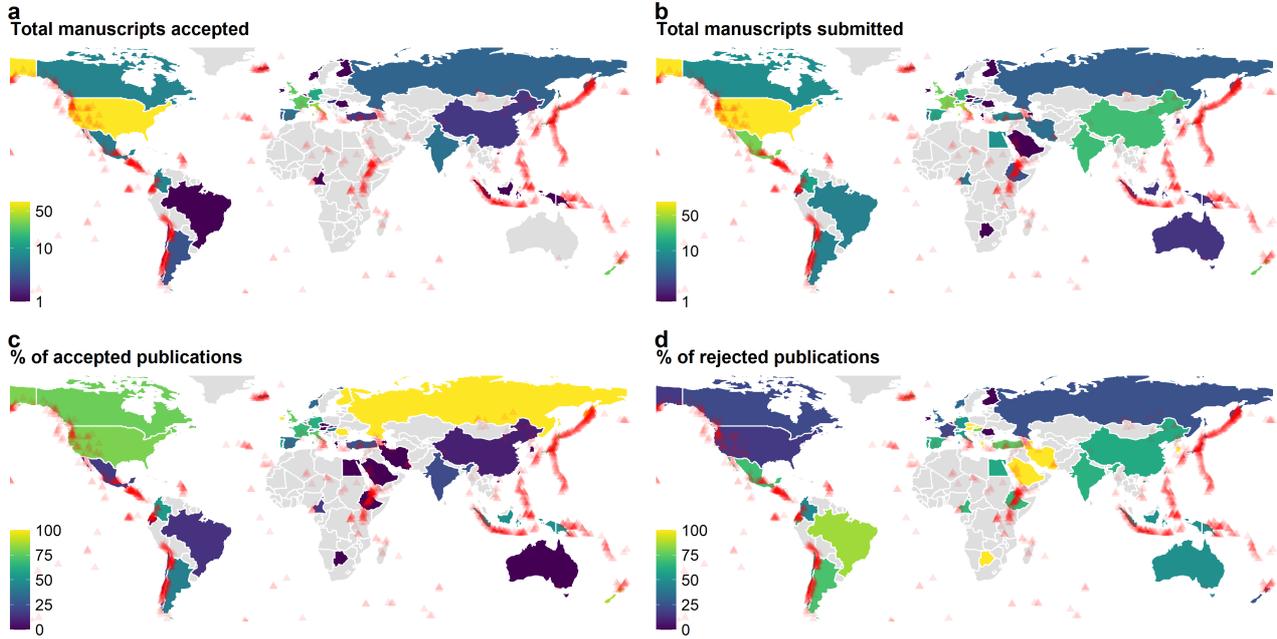
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22 **Figure S5:** Gender identity of a) total number of AGU VGP members and b) Students and Early Career
23 Researchers from 2014 to 2020.

24



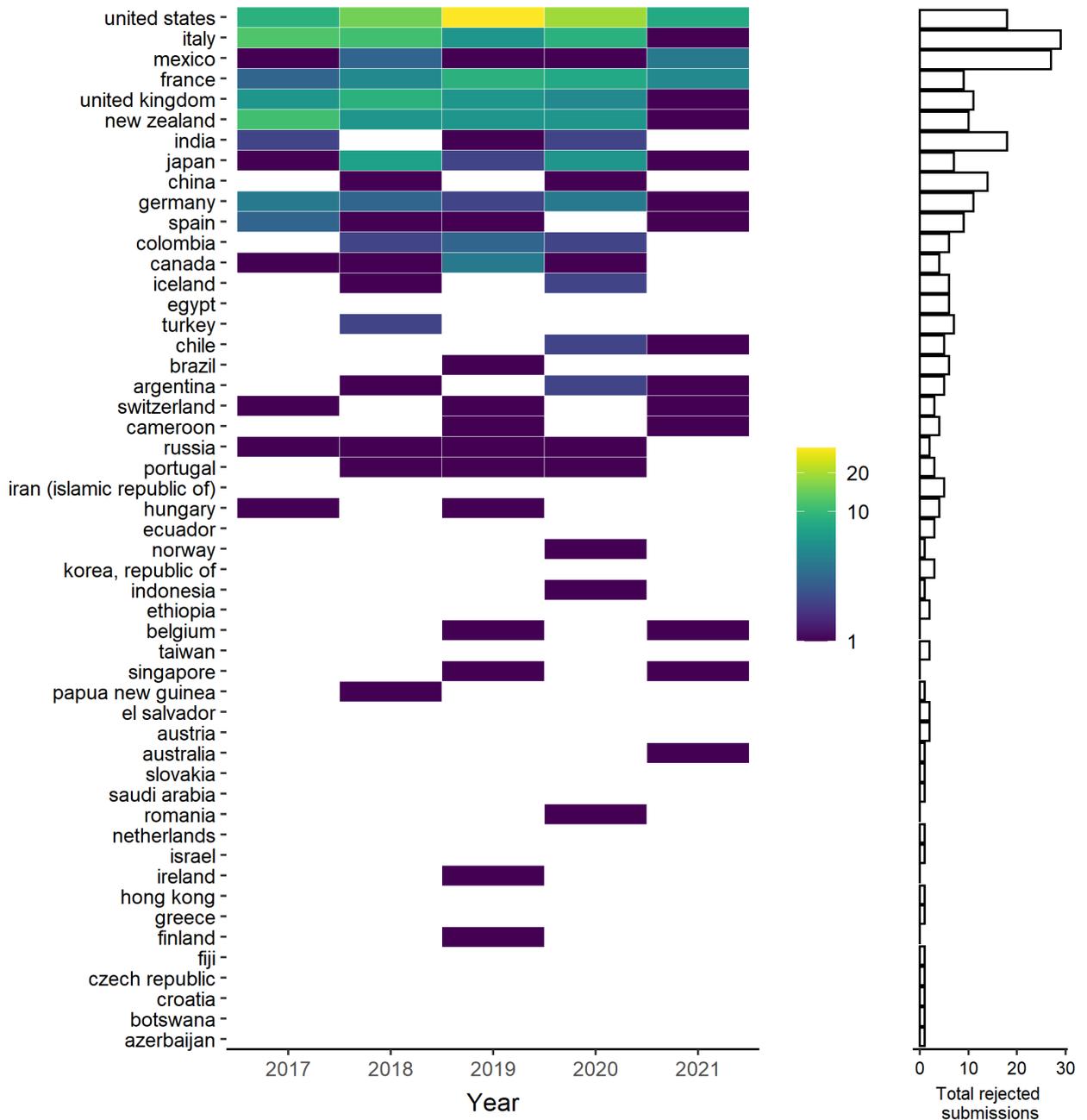
25

26 **Figure S6:** Bulletin of Volcanology publication statistics from 2017-2020: a) total manuscripts
27 accepted, b) total manuscripts submitted, c) percent of accepted publications, and d) percent of
28 rejected publications.

29

Publications in the Bulletin of Volcanol. from 2017 - 2021

The heatmap represents the number of papers accepted by BV.
 Countries are ordered by the total number of papers submitted from 2017 - 2021.
 Bars on the right represent the total no. submissions that have been rejected.

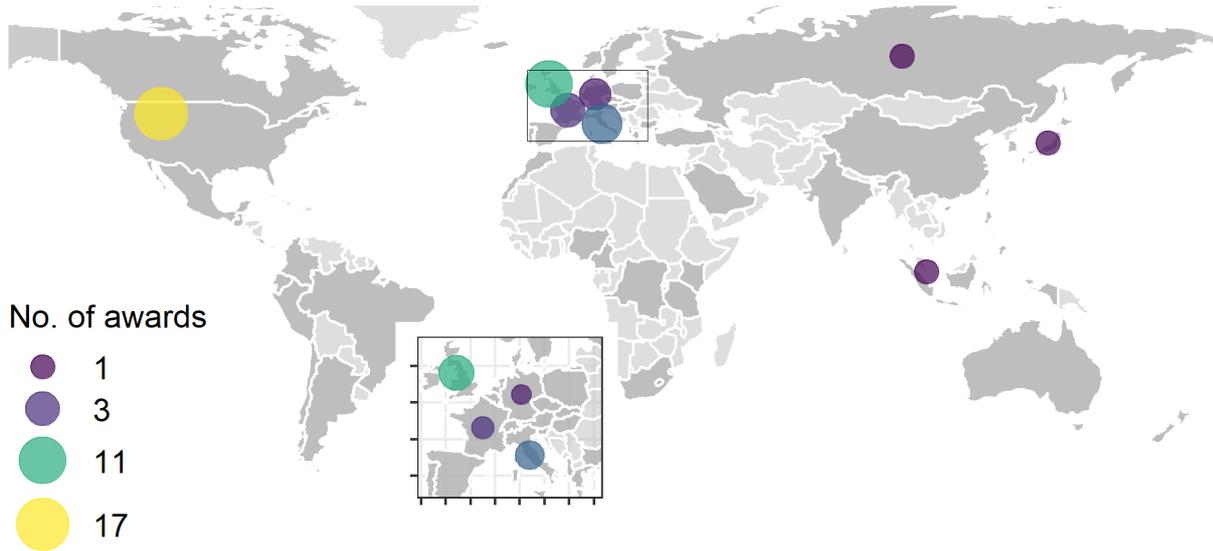


30

31 **Figure S7:** Heat map of the number of publications accepted and rejected by the Bulletin of
 32 Volcanology per country, from 2017 to 2020.

Countries of affiliation of IAVCEI Thorarinson, Wager and Walker award winners

Countries with IAVCEI members are darker grey.



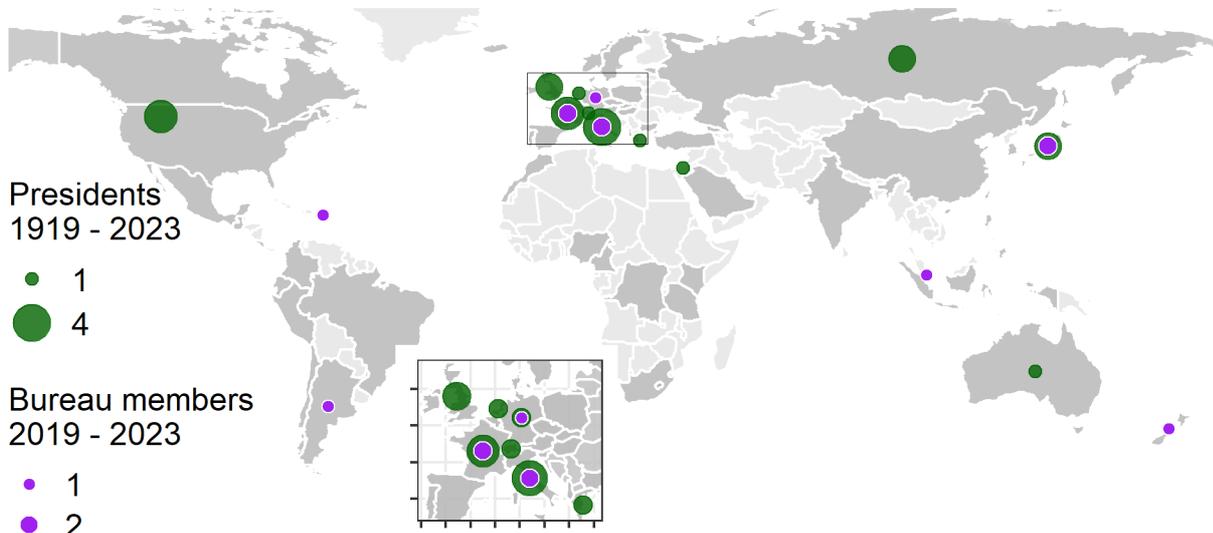
33

34 **Figure S8:** Country of affiliation of IAVCEI Thorarinson, Wager and Walker award winners - USA (17),
35 UK (11), Italy (6), France (3), Germany (2), Japan (1), Russia (1) and Singapore (1). Countries with
36 IAVCEI members are shaded darker grey.

37

Countries of affiliation of IAVCEI committee

Countries with IAVCEI members are darker grey.



38

39 **Figure S9:** Country of affiliation of IAVCEI Committee (2019-2023) and past IAVCEI Presidents (2019-
40 2023). Countries with registered IAVCEI members are indicated in dark grey.

41 3. Online Resource 3 - Description of Datasets

42 Self-identifying, intersectional data collection is a powerful tool to understand demographic trends
43 (Ali et al., 2021; Strauss et al., 2021). This section describes the datasets used in this paper.

44 a. Volcanology Publications Data

45 Bulletin of Volcanology – Data Source: Springer

- 46 • Number of submitted, accepted and rejected papers from 2017-2020
- 47 • Lead-author country of affiliation

48 Journal of Volcanology and Geothermal Research – Data Source: Elsevier

- 49 • Lead-author country of affiliation

50

51 b. Gender identity datasets

52 IAVCEI - Data Source: IAVCEI Secretariat/Guarant International

- 53 • Active members with dues paid by mid-2021
- 54 • Registration form includes: Gender (male/female), title, professional address
- 55 • Regular 1-year membership 50 EUR (lower for lower income)
- 56 • Young Researcher 1-year membership 15 EUR

57 EGU GMPV - Data Source: EGU Executive Secretary

- 58 • EGU membership GMPV division (2016-2021) as of 17th May 2021
- 59 • Option to select up to 3 Divisions as main affiliations
- 60 • Registration form includes: Gender (male/female/Other/Prefer not to say), Career Stage,
61 country of affiliation
- 62 • Gender identity data are less reliable back through time (<50% gender reported before 2020)

63 AGU VGP - Data Source: Business Data and Intelligence, Diversity Equity and Inclusion

- 64 • AGU membership VGP section (2013-2021) as of 24th September 2021
- 65 • Registration data includes: Gender (Female, Male, Nonbinary, Prefer not to answer,
66 Unknown, Prefer to self-describe), Career Stage (Student, Early Career, Mid-Career,
67 Experienced, Retired, Unknown), Region of affiliation (Africa, Americas, Asia, Europe,
68 Oceania, US, Unknown)

69

70 c. Awards and Keynotes/Plenaries

71 Aware of the caution expressed by Strauss et al. (2021) who demonstrated the harm that is done by
72 inferring gender, we conducted internet searches to infer gender identity of the recipients of prizes
73 administered by IAVCEI, AGU VGP, EGU GMPV and Natural Hazards Division, and VMSG (part of the
74 Geological Society of London), based on publicly available lists of successful past recipients, to
75 explore awards across a range of membership sizes and international/national groups. Where public
76 information wasn't available we wrote to individuals to ask them how they would like their gender
77 identity to be included in our analysis. Our approach was possible only because of the relatively
78 small number of individuals who have received volcanology awards over the reporting period. Some
79 awards have the option to award more than one recipient per year, and some awards do not make
80 a reward every time if the nominations are not deemed appropriate (see **Table S1** for details).

81 The names of IAVCEI Thorarinson, Wager and George Walker Award winners were obtained from
82 the VMSG website. The names of AGU Volcanology, Geochemistry, and Petrology (VGP) Normal L.
83 Bowen awardees, Hisashi Kuno awardees, and Reginald Daly Lecturers were obtained from the AGU

84 website. The names of EGU GMPV Robert Wilhelm Bunsen Medal, EGU GMPV Division Outstanding
85 Early Career Scientist Award, EGU GMPV Outstanding Student Poster and PICO (OSPP) Award and
86 EGU Natural Hazards Division Plinius Medal were found on the EGU website. The names of the
87 VMSG Thermo-Fisher Award winners were found on the VMSG website. The names of IAVCEI
88 General Assembly and IUGG Union Lecturers since 2013 were obtained from the IAVCEI website.

89 The nomination process for most of these honours (excluding the EGU OSPP Award) relies on an
90 external nomination letter and several additional letters of support. Because the language in
91 support letters is rooted in an external assumption of gender and therefore the award is given within
92 the context of those assumptions, we used the public perception of individuals to determine gender
93 presentation. This included the public websites of individuals, press releases about the awardee
94 receiving the award, pronouns in email and social media signatures, and other outward facing
95 information.

96 We recognize that the outward perception of gender is not the same as an individual's self identified
97 gender; for example, some non-binary individuals may choose to use only "safe" pronouns in
98 professional settings or are comfortable using a variety of pronouns, some of which align with
99 perception of a binary gender presentation.

100 **d. Committees, Networks and keynotes**

101 IAVCEI Committee structure - Data Source: IAVCEI Secretariat

102 IAVCEI Commissions and Networks - Data Source: IAVCEI Secretariat

103

104 4. Online Resource 4 - Survey on discrimination in volcanology

105 We conducted a short online survey where past and present members of the volcanology
106 community could share their experiences of discrimination in their volcanological studies or work.

107 a. Methodology

108 The survey was designed to understand the types of discrimination those currently or previously in
109 the field of volcanology have witnessed or experienced in their volcanological work or study. All
110 respondents selected that they agreed for their responses to be used in a publication and that it
111 would be anonymised. We did not collect contact information from the participants. Participants
112 were first asked questions about witnessing discrimination, then about experiences of
113 discrimination, with free-text boxes used to collect responses. These questions are summarised in
114 Table S2.

115 Ethical approval was obtained prior to commencing the research (see declarations). The survey was
116 targeted at volcanologists (self-identified) of any career-stage, working within any setting, in any
117 country. The survey was released 30th September 2021 and closed 3rd November 2021 and the data
118 were collected anonymously through a Google Form. It was written in the English language and was
119 advertised though the Volcano Listserv by the lead-author of this study and on Twitter via the
120 personal accounts of some of the authors. This means that it will have attracted responses from
121 those who had stories to tell, and those who felt they had faced discrimination, and so does not
122 reflect the proportion of the community who do not feel they have faced discrimination. Data is not
123 presented here as exhaustive, nor is it quantifiable, but to present a snapshot of the many
124 challenges and barriers faced by our community. We have categorised the accounts of
125 discrimination as follows to build the word cloud presented in Figure 5:

- 126 • Witnessed
- 127 • Experienced
- 128 • Toxic culture
- 129 • Ageism
- 130 • Bullying
- 131 • Narcissism
- 132 • Sexism
- 133 • Sexual harassment/Sexual assault
- 134 • Racism
- 135 • Homophobia
- 136 • Physical health
- 137 • Mental health
- 138 • Maternity leave
- 139 • Language
- 140 • Funding
- 141 • Fieldwork
- 142 • Socio-economic status
- 143 • Public humiliation

- 144 • Microaggression
- 145 • Complaint
- 146 • Physical appearance
- 147 • Other

<p><u>Share your experience of discrimination in volcanology</u></p> <p>This survey will take approximately 3-5 minutes to complete.</p> <p>All responses to this survey will be kept confidential and only used to produce anonymised statistics and quotes. The results will be analysed and some of the results will be published. Any identifying information in free-text comments will be removed prior to publication.</p> <p>We want to hear from as many people as possible: those who are actively working in the field of volcanology, and those who have since left.</p> <p>If you would like to discuss the survey or your response to it, please feel free to get in touch with the lead scientist: Dr. Janine Kavanagh (University of Liverpool) at discrimination.volc@gmail.com.</p>	
<p>I accept that the results of this survey will anonymised and may be used by the authors in a publication.</p>	<p>Yes</p> <p>No</p>
<p>1) Witnessing discrimination</p> <p>Discrimination means treating someone unfairly because of who they are based on characteristics such as: age, disability, gender identity, pregnancy and maternity, ethnicity, religion or belief, sexual orientation, socio-economic status, profession/job status.</p>	
<p>To what extent have you witnessed any form of discrimination against others as part of your work/study? Please select the most appropriate answer below or add your own. (In the next section you will be asked about experiencing discrimination).</p>	<p>I have never witnessed any of these issues</p> <p>I have witnessed these issues rarely (at least once)</p> <p>I have witnessed these issues occasionally (a few times per year)</p> <p>I have witnessed these issues frequently (at least once per month)</p> <p>I witness these issues constantly (daily)</p> <p>Other [free-text]</p>
<p>2) Experiencing discrimination</p> <p>Discrimination means treating someone unfairly because of who they are based on characteristics such as: age, disability, gender identity, pregnancy and maternity, ethnicity, religion or belief, sexual orientation, socio-economic status, profession/job status.</p>	
<p>To what extent have you experienced any form of discrimination as part of your work/study? Please select the most appropriate answer below or add your own.</p>	<p>I have never experienced any of these issues</p> <p>I have experienced these issues rarely (at least once)</p>

	<p>I have experienced these issues occasionally (a few times per year)</p> <p>I have experienced these issues frequently (at least once per month)</p> <p>I experience these issues constantly (daily)</p> <p>Other [free-text]</p>
What did the discrimination relate to? (select all that apply)	<p>Age</p> <p>Disability</p> <p>Gender identity</p> <p>Pregnancy and maternity</p> <p>Ethnicity</p> <p>Religion or belief</p> <p>Sexual orientation</p> <p>Socio-economic status</p> <p>Profession/job status</p> <p>Other [free-text]</p>
Where did this discrimination occur? (select all that apply)	<p>Current workplace</p> <p>Previous workplace</p> <p>Place of study</p> <p>During fieldwork</p> <p>Conference/professional event</p> <p>Social event related to work or study</p> <p>When applying for funding</p> <p>During publication of my work in a book/journal</p> <p>In service to the community (editor/convener/reviewer)</p> <p>When applying for jobs or study</p> <p>Other [free-text]</p>
3) Share your story	
Please share with us an occasion when you either witnessed or experienced discrimination in your work/study within volcanology. We will use these accounts to help raise awareness of the challenges certain individuals and groups face in volcanology - please be assured that all details will be anonymised.	[free-text]
4) Information about you	

In what age group are you?	18-25 26-40 41-50 51-66 >66 Prefer not to say
What is your gender registered at birth?	Female Male Prefer not to say
What gender do you identify as?	Female Male Transgender female Transgender male Non-binary Prefer not to say
What sexual orientation do you most identify as?	Asexual Bisexual Gay Heterosexual/Straight Lesbian Pansexual Prefer not to say Other [free-text]
What is your religion or belief?	Buddhist Christian Hindu Jewish Muslim Sikh No religion Agnostic Prefer not to say Other [free-text]
How would you describe your ethnic origin?	[free-text]
In which country do you mainly study/work?	[free-text]

Do you consider yourself to have a disability or long-term health condition (physical health)?	Yes No Prefer not to say
Do you consider yourself to have a disability or long-term health condition (mental health)?	Yes No Prefer not to say
5) Your study/work life	
Please select all the descriptors below which currently describe you.	Pre-university student Undergraduate student Post-graduate (M-level) student Post-graduate (PhD) student Early career (up to 10 years' full-time equivalent experience since terminal degree) Mid-career (10-25 years' full-time equivalent experience since terminal degree) Advanced career (up to 10 years before expected retirement) Retired Self-employed Working in academia Working in industry Working in government/state/local authority Working in education Not currently employed / inbetween jobs Other [free-text]
Thank you for your participation We appreciate the time you have taken to complete this survey. Below are some examples of where to read more about discrimination and to seek help if you have experienced discrimination in your place of study/work. https://www.citizensadvice.org.uk/law-and-courts/discrimination/taking-action-about-discrimination/before-you-take-action-about-discrimination/ https://www.ucu.org.uk/bullying	

148 **Table S2:** Questions asked in our discrimination survey.

150 **b. Guidance on EDI data collection and monitoring**

151 We encourage – where appropriate – the collection of as much information as possible on EDI. This
152 collection should always be based on the legal context of the region in which it is carried out (in
153 some countries, collecting such data may be highly restricted or unlawful).

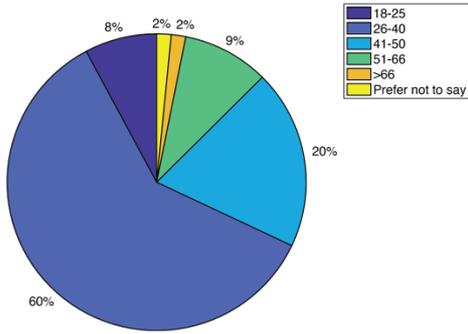
154 Good primers on the ethics and considerations of data collection are the United Nations
155 Development Group publication “Data Privacy, Ethics and Protection: Guidance Note on Big Data
156 for Achievement of the 2030 Agenda” (United Nations Development Group, 2017) and Science
157 Europe’s “Practical Guide to the International Alignment of Research Data Management” (Science
158 Europe, 2021). The Royal Academy of Engineering has a collection of resources on diversity
159 ([https://www.raeng.org.uk/diversity-in-engineering/professional-engineering-institutions/d-i-
161 progression-framework](https://www.raeng.org.uk/diversity-in-engineering/professional-engineering-institutions/d-i-
160 progression-framework)) including a primer for collecting data ([https://www.raeng.org.uk/diversity-
163 in-engineering/professional-engineering-institutions/resources](https://www.raeng.org.uk/diversity-
162 in-engineering/professional-engineering-institutions/resources)). The Equality, Diversity and
164 Inclusion in Science and Health Group have a variety of resources, including Diversity and Inclusion
165 Survey guidance (<https://edisgroup.org/resources/practical-tools-and-guidance/>). In recognition of
166 the structural barriers to gender equality in research, the European Commission recently announced
167 that from 2022 onwards host institutions wanting to apply to its Horizon Europe funding programme
168 will be required to have a Gender Equality Plan (GEP) and has provided guidance to support
169 organisations developing their GEPs (Directorate-General for Research and Innovation, 2021). Some
of our suggested resources will be not appropriate for all cases; organisations should seek out
similar guidance for the country in which they are based.

170 **c. Characteristics of survey respondents**

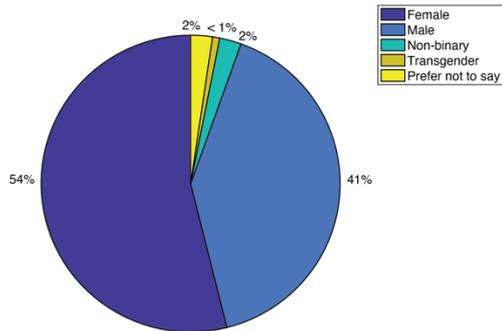
171 In total there were 128 responses to our survey, and Figure S10 shows the age, gender identity,
172 sexual orientation and religion of the respondents. Table S3 details the number of respondents from
173 each country listed, and Table S4 details the information provided regarding physical and mental
174 health.

175 The respondents were asked to self-describe their ethnicity through the question: “How would you
176 describe your ethnic origin?” – 116 individuals (93% of participants) responded to this, with 64 (55%)
177 describing themselves as ‘White’ or ‘Caucasian’ and 52 (45%) indicated non-White ethnicity (e.g.
178 Arab, Asian, Black, Latino, Mixed/Multiple ethnic groups) or used a geographic identifier (e.g.
179 African, East Asian, European, Indian, Middle East).

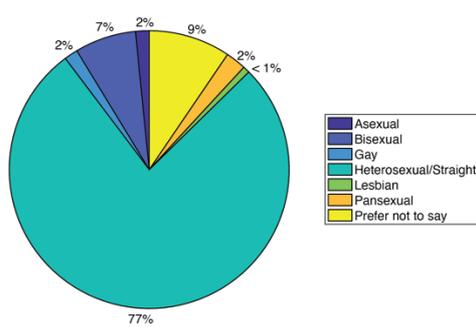
a) Age (128 responses)



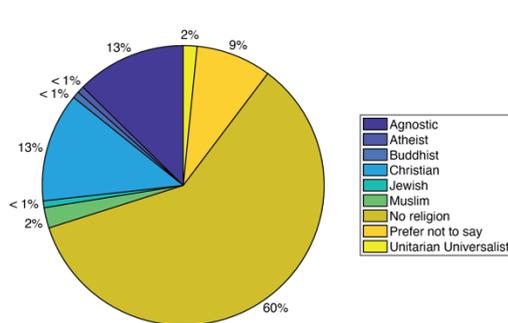
b) Gender identity (128 responses)



c) Sexuality (127 responses)



d) Religion (127 responses)



180

181 **Figure S10:** Protected characteristics of the survey respondents: **a)** “In what age group are you?”
 182 (128 responses), **b)** “What gender do you identify as?” (128 responses), **c)** “What sexual orientation
 183 do you most identify as?” (127 responses), and **d)** “What is your religion or belief?” (127 responses).

184

185 **Table S3:** Survey responses to the question “In which country do you mainly study/work?” (119
 186 responses (93% of total participants), some individuals listed more than one country).

Country	Number of respondents
Australia	2
Canada	2
Chile	4
Colombia	1
Czech Republic	1
Eastern Caribbean	1
France	4
Germany	3
Greece	1
Iceland	1
Ireland	3
Italy	4
Mexico	1
New Zealand	7
Russia	1
Scandinavia	1
Singapore	4
Southeast Asia	1
Spain	2
Sweden	6
Switzerland	3
Turkey	1
UK	30
USA	43
Prefer not to say	1

187

188

189 **Table S4:** Survey responses to the questions related to physical and mental health (127 responses,
 190 99.2% of participants): **A)** Do you consider yourself to have a disability or long-term health condition
 191 (physical health)?, and **B)** Do you consider yourself to have a disability or long-term health condition
 192 (mental health)?

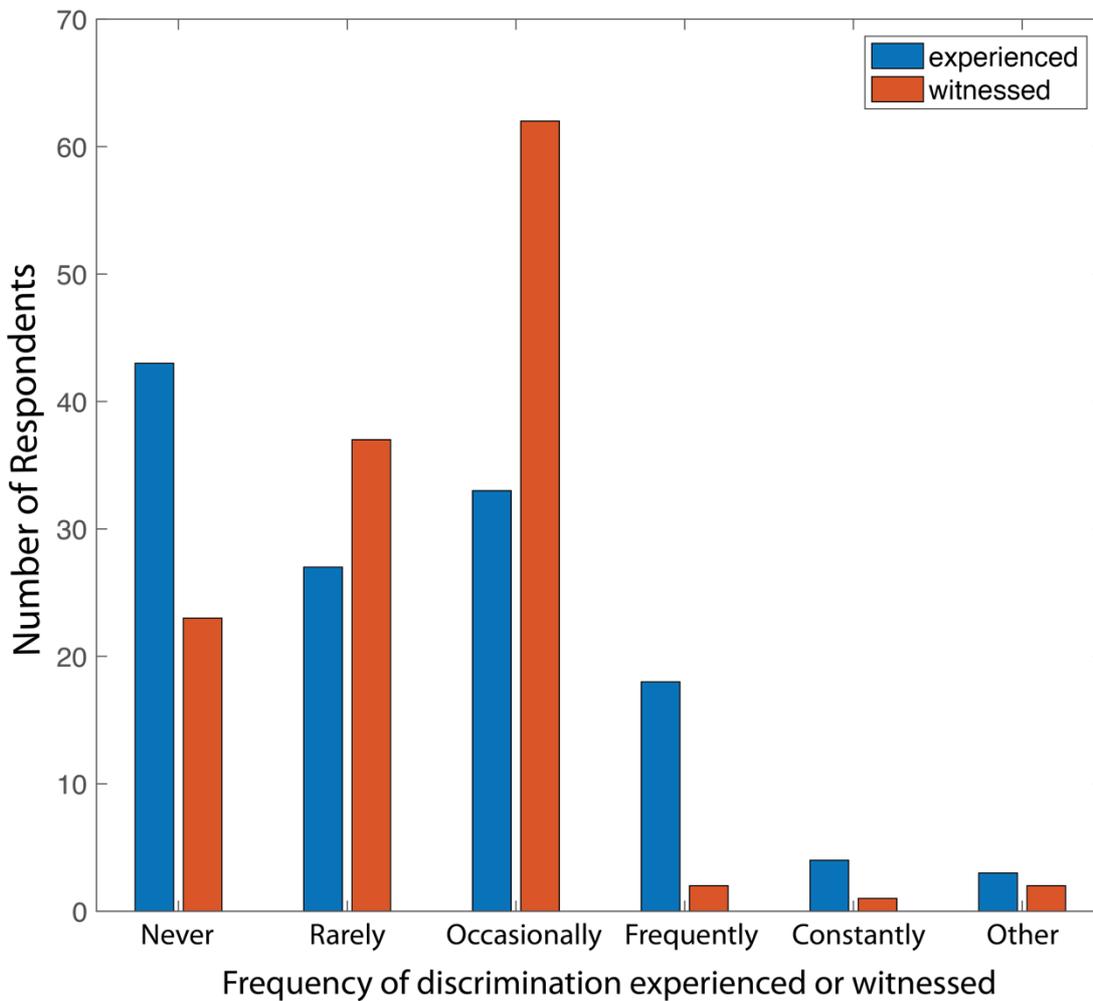
	A) Physical disability or long-term physical health condition	B) Mental health disability or long-term mental health condition
Yes	11 (8.6%)	15 (11.7%)
No	110 (85.9%)	103 (80.5%)
Prefer not to say	6 (4.7%)	9 (7.0%)
Total responses	127 (99.2%)	127 (99.2%)

193

194

d. Discrimination frequency

195 Survey participants were asked to what extent they have witnessed and/or experienced
 196 discrimination, with the following definition provided in the survey: “Discrimination means treating
 197 someone unfairly because of who they are based on characteristics such as: age, disability, gender
 198 identity, pregnancy and maternity, ethnicity, religion or belief, sexual orientation, socio-economic
 199 status, profession/job status.” A graphical representation of the results are shown in Figure S11.
 200 Overall 85 respondents (66%) reported experiencing discrimination and 104 respondents (82%)
 201 reported witnessing discrimination. From those who reported experiencing discrimination, 55 (43%)
 202 reported that this happened a few times per year or more. Four respondents reported constantly
 203 experiencing discrimination (daily).



204

205 **Figure S11:** The extent of experienced (128 responses) or witnessed (127 responses) discrimination
 206 reported by survey participants, where discrimination is defined as ‘treating someone unfairly
 207 because of who they are based on characteristics such as: age, disability, gender identity, pregnancy
 208 and maternity, ethnicity, religion or belief, sexual orientation, socio-economic status, profession/job
 209 status.’ The following responses were available to survey participants: 1) I have never witnessed any
 210 of these issues, 2) I have witnessed these issues rarely (at least once), 3) I have witnessed these
 211 issues occasionally (a few times per year), 4) I have witnessed these issues frequently (at least once
 212 per month), 5) I witness these issues constantly (daily), and 6) ‘Other’ (participants can type their
 213 own response).

214 **e. Discrimination accounts – categories and transcripts**

215 Table S5 details the anonymous full transcripts of all free-text comments in response to the
 216 statement *“Please share with us an occasion when you either witnessed or experienced
 217 discrimination in your work/study within volcanology. We will use these accounts to help raise
 218 awareness of the challenges certain individuals and groups face in volcanology - please be assured
 219 that all details will be anonymised.”*

220 Any potentially identifying information has been removed in square brackets to maintain
 221 anonymity. Other than this, we have not edited these transcripts and have kept original typographic
 222 errors. The statements are numbered and all respondents who wrote statements are included.
 223 Some of the statements contain phrases or words that are unacceptable. They reflect the view of
 224 the respondents only.

225 **Table S5:** Full anonymised transcripts of experiences of discrimination in volcanology detailed in the
 226 online survey conducted in this study. The respondent number is indicated (out of 128 total
 227 responses) and the categorisation of the story described according to the following coding:
 228 Witnessed (W), Experienced (E), Toxic culture (Tx), Ageism (A), Bullying (B), Narcissism (N), Sexism
 229 (Sx), Sexual harassment/Sexual assault (Sxh/a), Racism (R), Homophobia (H), Physical health (Ph),
 230 Mental health (Mh), Maternity leave (Mt), Language (L), Funding (Fu), Fieldwork (Fw), Socio-
 231 economic status (Soc), Public humiliation (P), Microaggression (Ma), Complaint (C), Physical
 232 appearance (Pa) and Other (O).
 233

#	Response	Categories
1	<i>In my previous research group (where was one of the senior people), the PI regularly commented on other colleagues' nationality in a negative way. For example: "As is typical for [person from specific country] people, she's crude." "Professor X is a refugee from [specific country]. Therefore he wants to build a new minority government here." Or "... Therefore he doesn't like women." The PI also frequently discussed and actively tried to manipulate his PhD students private life. For example "PhD student Y's boyfriend is not good for her. He has far too much influence on her and distracts her from work." Another example: The PI was seriously questioning another PhD student's commitment to her PhD when she started to date a new guy. The PI was inferring that the only thing she had on her mind was getting pregnant. None of these things were openly mentioned to the people in question. Everything was discussed in the PI's inner circle of senior researchers. However, these discussions led to a lot of conflict in the research group and the department. The research group finally collapsed and the professor is now banned from supervising PhD students.</i>	E W R Sx Tx N Mt
2	<i>If I were to share my stories, I would have to write a book. Mabe I will eventually.</i>	E
5	<i>Derision from my advisor at the mention of wanting to start a family. Overt racism to a [specific country of origin] colleague for "having bad English" - she's a US citizen and speaks English at a native level.</i>	E W Mt R L
6	<i>1) When I was a MSc student, I was publicly humiliated for wanting to do a PhD with a well-known researcher in volcanology by a member of my own research group. This person had a history of being narcissistic and demeaning bully, and at the time was not progressing in his project. I was also one of a few students in the department who comes from an ethnic minority and was successful in my project, and the bully was Caucasian male student. It took years to disclose this incident to my ex-supervisor, and impacted my PhD experience extremely negatively. When I did disclose it to said ex-supervisor, instead of supporting me,</i>	E P N B C R Fu Ma

	<p><i>he blamed me for not speaking up and never even bothered to name the perpetrator in his assessment. The ex-supervisor continued to show support for the bully. Members of the public who were at the incident also did not intervene, and one of them claimed they "didn't know" how to respond.</i></p> <p><i>2) I also strongly believe I was discriminated against based on my race in a well-established funding competition, where the same bully in (1) won [a certain number of times] without having shown progress nor fulfilled 2/3 of the stipulations listed in the eligibility section. One of the stipulation stated that the applicants should present their research at an in-house symposium, but he did not [do this]. The panel was [not diverse], and the winners heavily reflected favouritism for their students.</i></p> <p><i>3) in the first few months of my PhD I encountered quite a few instances of hostile gatekeeping behaviour from two well-known "popular" postdoctoral researchers. They bluntly said that "there were too many PhD students" during my first few months as a PhD student, and heavily implied that I won't get a faculty job before I had a chance to prove myself. They had issues landing jobs, and likely saw me as an opportunity to vent their frustrations.</i></p>	
8	<p><i>I was propositioned by a male student in front of a dozen other male students and two male profs, on a field trip. No one did or said anything.</i></p> <p><i>On a field trip, in the desert, it was hot and we had all been drinking a lot of water, so everyone really needed to urinate. On a pause, every other participant (all male) simply turned their backs on the vans and peed. Since there was no cover, I could not pee in privacy so had to wait. I asked the trip leader to stop at a gas station so I could use the toilet, but he refused because he said he was in a hurry. I had to wait several hours, badly needing to urinate, before I was finally allowed access to a toilet.</i></p> <p><i>In university, I witnessed a prof make disparaging remarks about a [person from a specific country] classmate. The same prof was also sometimes both misogynistic and racist at the same time: on a field mapping exercise in a small town, he said "There will be no all-girl mapping teams, because you need men to protect you from the drunken Indians".</i></p> <p><i>At my current job, on a field project, a supervisor told two male summer students that my mineral identifications were wrong and suggested I was incompetent (he never spoke with me about any supposed errors in my work). He also gave me instructions, which I followed, then publicly chastised me for following the instructions. This same supervisor ignored several female summer students who did not meet societal standards of prettiness, providing no assistance with their projects and barely even speaking to them, while</i></p>	<p><i>E</i> <i>Fw</i> <i>Sx</i> <i>W</i> <i>R</i> <i>Ma</i> <i>O</i> <i>Mt</i> <i>Sxh/a</i> <i>H</i></p>

	<p><i>lavishing aid and attention on several conventionally pretty students. His attentiveness did not correlate with the actual academic skills, work effort, and overall performance of any of the students.</i></p> <p><i>At my current job: when I returned from maternity leave, a senior manager (male), asked me if I was going to get pregnant again, and asked if he should have a talk with my husband to ensure I did not. This same manager has harassed and belittled me for over a decade - this is not obviously "sexual harassment", but he treats most if not all female colleagues this way and has a string of formal complaints against him that does not appear to have affected his career in any way.</i></p> <p><i>I note that although none of these examples of harassment appears particularly horrific (I was never physically threatened or touched), many of them either don't fit a formal definition of harassment and/or are impossible to prove, and several are not obviously linked to sex, they all fit into a longstanding pattern of low-level harassment: questioning the competence of women, treating women like sex objects, denying the needs of females while giving male students/workers whatever they need. If someone threatens you at work, you can make a harassment complaint. However, when you are just treated a little differently, a little worse, over and over again, you have no recourse and just have to endure it.</i></p> <p><i>Dealing with a single episode like those I have experienced would not be a big deal. However, dealing with a career-long string of incidents like these, involving multiple male colleagues in different organizations, has severely impacted my self-confidence, and made it really tough to assert myself in work situations.</i></p> <p><i>I add that the instances of racism and homophobia I have witnessed, although not directed at me because I am white and hetero, were really disturbing, and I am sure they are just the tip of an iceberg. I can only imagine how hurtful and anger-inducing such events (no doubt also part of a prolonged pattern) are for the victims.</i></p>	
9	<p><i>Witnessing gender/Physical discrim: have witnessed a male senior volcanology professor say openly and scathingly that someone was no good for a PhD project because "she was too fat to get up the hills"</i></p> <p><i>Subject to inappropriate behaviour by senior male volcanologist on trip: I was on fieldwork as a junior PhD student with senior male academics where one male professor told me that another male senior volcanology lecturer (married) quote "likes me" and I should "watch out for him, he's bad news". As an early career PhD, I felt incredibly uncomfortable during the whole trip because of the senior lecturer's inappropriate flirting, and felt ashamed that others on the trip may think I was encouraging it.</i></p> <p><i>Subject to gender discrimination by another woman: I have been at a</i></p>	<p><i>W</i> <i>Sx</i> <i>Ph</i> <i>FW</i></p>

	<p>conference social as a PhD student where I played pool with a volcanology professor- nothing untoward, platonic. Afterwards, a female volcanologist told me "x likes blondes" suggestively, and insinuated I was trying to flirt with him to get ahead. For a long time this has stayed with me, as it was from a fellow woman. It made me feel I would never be taken seriously.</p> <p>These incidents, unfortunately all during my PhD, made me see volcanology as a very toxic place for a woman.</p>	
11	<p>I was assaulted on a field trip ran by [specific Geoscience organisation], by another person attending the field trip. They tried to pull to their room to sleep with them and wouldn't listen when I told them no.</p> <p>I got told to smile more and be more attractive on feedback from [specific student presentation assessment] at [specific international conference].</p> <p>A well known volcanologist took an interest in my work and asked me to come on field work with him from very early on. As soon as other people left us alone on the trip, he asked me to come to his room and started undressing in front of me. He also got drunk and drove us back to the hotel whilst drunk. I had no other way to get back otherwise I wouldn't have gone with him. He constantly told me that my supervisor didn't get me and that I should only talk to him. He also told me to stop acting like a victim when I answered a question he asked me about previous negative experiences I had.</p> <p>A lot of jokes about how I speak, saying how 'common' it is. Telling me I would have to sleep with my supervisor to get my PhD.</p>	<p>E</p> <p>Fw</p> <p>Sxh/a</p> <p>Soc</p> <p>Sx</p>
14	<p>I have experienced and observed discrimination against individuals with autistic spectrum disorder (ASD). I believe, in my own experience, that this form of discrimination and a general lack of understanding surrounding this complex condition is more common than many would believe, and it is sadly regarding as being of less interest when compared with discrimination based on other characteristics such as gender or ethnicity.</p> <p>My own experiences of this style of discrimination range from a benign disregard or slightly cruel amusement at efforts made by someone such as myself to appear 'normal' and blend in, through to a quite intense and targeted campaign of workplace bullying, which prompted severe depression and self harm. On one occasion, facing regular verbal intimidation from a more senior staff member, I was so distressed by the prospect of going to work and unable to function adequately that I took a shard of broken glass to my own neck. The individual in question was the departmental equality and diversity officer, and knew that she could treat me as she wished without fear of punishment based on the fact that I was, due to my ASD, not socially capable of handling her regular verbal attacks or managing the intimidating and confrontational situations she forced upon me. This included e-mail barrages, regular insinuation of inadequacy in my job and general failure to provide required</p>	<p>E</p> <p>W</p> <p>Mh</p> <p>B</p> <p>Ma</p> <p>C</p>

	<p><i>support, face-to-face bullying, and threats of false accusations of sexist behaviour.</i></p> <p><i>No action was ever taken against the individual, and she is still working in the same institution, having been promoted to a more senior role as recognition for her contributions to equality and inclusivity in the workplace.</i></p>	
15	<p><i>I have been erased by list of authors of papers I have written and I have worked for because I went on maternity leave</i></p>	E Mt
16	<p><i>I feel that in volcanology there is a male-dominated culture, and this is reflected in many of the 'leaders' such as award-winners of leads of committees like IAVCEI are male. It's really hard to find diverse role models.</i></p> <p><i>When I was a PhD student (10 years ago now) there were a few male volcanologists who seemed to use social activities as an opportunity to try and seduce female PhD students. I really hate that so many of the social activities in volcanology seem to revolve around alcohol. I hope things are changing, but I'm really not sure they are.</i></p> <p><i>I think that women in volcanology are often 'forgotten' or their scientific contribution is devalued relative to a male of similar career stage. For example, in my previous institution there was an example of a male and female PhD student working together on a project - the male was automatically put by the supervisor as a co-author on the female's paper, but the female in the end was not a co-author on the male's paper yet their scientific contribution were the same.</i></p> <p><i>It is so infuriating to see editorial boards of books, or IAVCEI Commissions for example being all male. The impression is that there are no female leaders in these fields, but when you see contributions at conferences this clearly is not the case. Are women not being invited? Or are they not accepting the invitations?</i></p> <p><i>At my current work place I see every day evidence that I am treated differently by support staff, and sometimes my colleagues, because I am a woman. I feel I am expected to do more 'low skill' and time consuming tasks compared to my male equivalents. I am asked also to do more administrative tasks than my male colleagues, and I'm supposed to feel it is a compliment to be asked as they know I will do a good job. Yet these tasks take time away from my scientific research, which is ultimately on what my career progression is based. I really wish I had a mentor to guide me in my career and more positive role models.</i></p> <p><i>I feel like organisations such as IAVCEI really need to step up, recognise there are real issues in volcanology that need to be addressed related to gender, ethnicity and other important factors, and show real leadership in bringing forth positive change in our subject.</i></p>	Sx Tx O

18	<i>I was repeatedly asked to leave talks at [specific international] conference[s] for standing at the back (I have to stand because of my chronic illness). I had asked in advance if this was okay and had been told it would be fine, but every single talk I attended security questioned me, in some cases let me stay but it was still very disruptive, in others told me I had to leave, no exceptions to no standing rule.</i>	Ph E
21	<i>joking' casual homophobic remarks were common at this [specific country] University in lecturer offices in the 2010s, and it was hard to listen to if you weren't out then like me. It makes it worse in the present day that some people who did this now have very senior positions in the scientific community and virtue signal all the time on social media about equality and social justice. Literally the definition of not having integrity. I'm not sure they even realise they did this in the past.</i>	H W
22	<i>Assumptions about sleeping arrangements on field work without checking re sexual orientation</i>	Fw Sx
23	<i>was fondled by female boss</i>	Sxh/a E
24	<i>Passed over for student fieldwork opportunities (even though I am very qualified) because I am not regarded as "outdoorsy" due to gender, race and other social factors.</i>	Fw Sx R Soc E
26	<i>During a field experience, the field leader was very strict about not allowing women to fall behind the group while we were walking to the next location to go to the bathroom. There were no trees in the area so the best option for going to the bathroom and avoid being discovered was to go when the group was moving together in one direction when we passed a large-enough rock. Once the women re-joined the group, we (all members together) were loudly reprimanded, including degrading our work ability and cursing at us.</i> <i>"Early career" fellowships, grants, and poaitions have age cutoffs. This runs counter to the Braided Stream model of career progression. I have "aged out" of many such fellowships and positions.</i>	Fw Sx E Ma A
28	<i>I have personally received comments about my appearance as a woman at conferences - mainly things like how it is "so much easier" to pay attention to a "woman in a dress" giving a scientific presentation. I have also gotten negative comments about my age or disability. I am fortunate that my experiences have stopped at just comments (that I know of).</i> <i>I don't know if it counts for your survey, but I have heard (not witnessed) first hand instances of sexual harassment and manipulation (abuse of power) of students, undergrad to PhD, and post-docs, and even senior faculty. Everything</i>	E Sx A Ph W Sxh/a Fu

	<i>from professors sleeping with students and postdocs, to withholding funding from students if they didn't dress a certain way when asking for the money for a chemical or equipment they need for their research, to taking photos up female undergraduate/Honours/MSc's skirts and ranking students based on their attractiveness on field trips. In my experience, all of these complaints were against 2-3 professors only, but their actions and comments affect the morale and well-being of the entire department substantially.</i>	
31	<i>Not being given the chance to co-author a paper despite having spent significant time helping out. At the same time, I see others (both junior and senior folks) who contribute much less, sometimes hardly anything, repeatedly being put on papers, which only results in reinforcing their status as a well-known and/or promising researcher. This practice tends to happen in the inner circle of the big volcano groups at the "renowned" [specific country] universities (who tend to belong to the same academic dynasty); though it might of course be more widespread. If you enter the space as an outsider (foreigner, with a degree from elsewhere) you just have this feeling you will never really belong, no matter how friendly people are to you in your face.</i>	E Tx
33	<i>Crying white female coworkers are bullying entire divisions, males, females, handicapped, colored people alike, and draw all attention by superior onto them.</i>	B
35	<i>Colleague got pregnant during her PhD, didn't get her contract renewed, had to move department to finish her thesis. Male colleagues with children get renewed contracts all the time, even get permanent positions offered. In the field I'm always careful to express discomfort, cause otherwise I get the pity look and the frown of "women, weak" from my almost all male group of collaborators. If I'm talking about packing for field and considerations on garments and what to pack I'm often reminded that I'm not going for a catwalk. Of course it's just a joke, never addressed to male colleagues tho...</i>	Mt Fu Fw Sx
37	<i>My previous boss, didn't hear my suggestions or ideas, he only agreed if one of my male counterparts mention the same thing. / I know of female colleagues that were paid less than the male counterparts for the same job, and same boss./ Due to my accent while doing my grad students some people dismiss me because they didn't understand me, instead of letting me explain. / During a field campaign I notice how a fellow PhD student was treated as a "personal assistant" to her PhD advisor. On the field, she carried everything, marked everything and in the camp site, she was in charge of food and everything else as well.</i>	B Sx L E W
38	<i>I experience gender based discrimination regularly during fieldwork season. Usually related to 4x4 driving, being in remote terrain without men etc. I am a qualified wilderness EMT and have 8+ years of 4x4 winter and summer experience in difficult terrain. I am purposefully seeking out extra qualifications (medical, mountaineering or driving based) just so I can be given the same opportunities as men in my field with less experience.</i>	E Fw Sx

39	<i>Staff members in my department have made very negative comments about LGBT people, presumably under the assumption that no one listening is part of that group (I am, but closeted).</i>	W H Sx
45	<i>- repeatedly being asked if I got my job because I was a woman in post-doc position - commonly asked to perform extra admin duties, while equivalent males given extra time to do research - male colleagues present my ideas, research, results, work as their own</i>	Sx E Tx
48	<i>Jobs and funding going to females that are less qualified than male counterparts. Jobs going to known people in own network</i>	Sx O
51	<i>I was the only female and only westerner in my research group ([list of students from particular countries]). I was called fat and weak repeatedly and basically abandoned for the last two years of my PhD. When I asked if students from the [other specific continents] were just not applying to my advisor he said, no they do, I just find that they aren't as good as [person from a particular country] at math so I don't accept them. I did enjoy the perk of having my own office with a window because it was inappropriate for me to be in the same workplace as men, but it left me very isolated scientifically and socially.</i>	Sx B E Tx Pa
52	<i>A senior male volcanologist, without consulting me, made decision that because I am a woman (his words) I should not be deployed for field work that involved sleeping in dusty and primitive conditions. I would have LOVED this opportunity, and had no concerns about the dusty and primitive conditions.</i> <i>Less than half an hour after it was announced at the end of a major conference where the following would be held, at a place near where I live, I congratulated one of the co-organizers, a white senior male I didn't know that well but had interacted with in the past. His immediate response was, do you want to be on the organizing committee, we need a woman. There was no mention of why me (I provide access to x community, I am knowledgeable in y discipline, etc.), only my gender was of interest.</i> <i>The [specific conference] cultural performance celebrating the end of the conference sexualized and objectified teenage women. That was very upsetting, and put a damper on the conference for me.</i> <i>The [specific conference] plenary speakers were all male the first four days of the five day conference.</i>	E Sx Fw Tx
54	<i>Verbal sexual discrimination from elder male volcanologist to younger female volcanologists is rather prolific. I've witnessed this both verbally and physically numerous times. From professors inappropriately stroking their students backs,</i>	W Sxh/a

	<i>hair, arms, etc. to being smacked on the ass or told, "I wish I was more than your professor." These instances are honestly too numerous to remember.</i>	
55	<i>At my previous position, research scientists (particularly male) treated lower payscale support staff (GIS, web, technicians) like crap. They ignored them, excluded them, teased them, and discredited them. It was awful.</i>	B W
56	<i>Several times me and my female colleagues were declined to go to field trips based solely on our gender (female)</i>	E Sx
60	<i>I'm a white male, so subject to very little discrimination. But when I was being considered for promotion at one time, I had multiple colleagues tell me that I was young, and still had plenty of time to advance, and that it was a bit "early" for me to be promoted. My age (below 40 at the time) should not have mattered -- just my record. Obviously a very minor episode compared to what others have experienced.</i>	E A
62	<i>Discrimination may be too strong but it is perceived to be there owing to widespread 'casual sexism'. Comments and instruction on how to dress, limited physical capabilities, inappropriate behaviour from senior male collaborators. Pay gap in expenses handling.</i>	Sx
63	<i>Many years ago, I applied for graduate school and was accepted to work with a prominent, male volcanologist. Unfortunately my first name is a male first name, and the advisor assumed I was male.</i> <i>On arriving to begin working under his guidance he insisted I was unable/incapable of carrying out remote, petrologic fieldwork as a female student, as 'what would we do with you in the field; it would be so difficult'. After months of discussion with other/male graduate students as well as the professor, I realized he had assumed an incorrect gender for me based on my application, and there was no way I could continue as his student and be funded. He absolutely would not allow me to participate in the science I had been accepted to do.</i> <i>I left graduate school for 2+ years, and worked; then with eyes wide open applied for admission to PhD programs, and completed one in a different subject with my own funding.</i>	E Fw W
69	<i>I was on a trip in a foreign country and I asked if I could engage in field excursion which involved carrying equipment up a volcano, which two young male-identifying students my age were invited to engage in. I was told that, yes, I could participate and help them carry the equipment up the mountain. Last minute I was called and told there was no need for me to come and participate. There was no explanation, and the two young men grad students were still able to participate in the field work. I work out and I am in good shape physically, and I am trained as an outdoor leader and led outdoor excursions before, but I am a female. I believe it was due a perception about</i>	F Sx E

	<i>my strength/fitness as a female. I would have had to complain or push my way in to be able to keep that opportunity, and I did not feel it was worth it.</i>	
71	<i>1- I regularly publish my researchs. Basing on 30 years of experience, when I have a [specific country] reviewer, I am sure that the paper is rejected. That's why I ask to editor to avoid any [specific country] in editorial process.</i>	E R
77	<i>The list is so long. I think I'll contact you directly.</i>	
79	<i>I have witnessed that a white middle aged successful professor has been bullied by several female junior researchers. Even the professional external help that was involved to solve the conflict has been bias and acted not according to the facts but according to the current believe system.</i>	W B
80	<i>Witnessed several female PhD students being sexually harassed by their male PhD supervisor who retaliated if rebuffed (bad-mouthing to industry contacts, refusal to provide academic supervision/support, etc). By contrast he treated his male PhD students very well.</i>	W Sxh/a Tx Sx
81	<i>Administration of research: my voice was ingnored, but when a mal said the same think it raised attention. A a woman, I experience that pleople never think of women for responsibilities</i>	Sx Tx E
82	<i>I'm not ready to share this story yet. The person that has actively discriminated against me throughout my career is a highly active member of the volcanology community, and as an ECR still finding my way onto the academic pyramid, I can't deal with this yet. I hope you get lots of stories though, they need to be told. I also hope you're able to capture some of the discrimination that has been felt my people outside volcanology but at the hands of scientific teams in-country to the local populations.</i>	E
84	<i>I was a postgraduate acting as a demonstrator on an undergraduate field trip abroad. H&S rules dictate that a back up car be driven with the coach in case of accidents in the field. Two male lecturers (including the volcanologist this story relates to) and myself were added as drivers to the car. On the first day of the trip the volcanologist said he was too ill to go so I ended up driving the back up car. On the second day I was preparing to drive when I walked up and said that he didn't want me to drive, grabbed the keys out of my hand and forced me out of the drivers seat. We would eat out every evening and the better restaurants needed to be driven to. When I pointed out that the volcanologist didn't want me to drive during the day he said that he had already started drinking alcohol so wasn't able to drive everyone. On the first evening, when we arriving back to the accommodation, he would make disparaging comments about my driving skills. This tension went on all week with no other members of staff dealing with it. There was a tradition on the last night of setting up BBQs for the undergraduates and having a party. I was tired, didn't want to drink and agreed to be the designated emergency driver. Unfortunately there was a medical emergency with a female undergrad. As there were no female members of staff I was not only required to drive but also</i>	Fw Ma E Sx

	<i>accompany them to the hospital. We got back at 1.30 am and had to be up at 6 am to travel to the airport. I knew I was tired after dealing with the hospital, the other back up driver was also the field trip leader and had been at the hospital so we wanted the volcanologist to drive. He had drunk so much the night before that he was still over the limit. There were two female undergrads not feeling well so the decision was made that I would drive, with the two other female postgrads and two female undergrads. On the way to the airport we were involved in a hit-and-run. We had to deal with the police before leaving the car and continuing to the airport on the bus. When I got on the bus the volcanologist made a comment about 'female drivers'. Upon our return to the department I was not asked about what had happened, no follow up checks and I was blacklisted from demonstrating on any other field trips. Meanwhile, the volcanologist faced no repercussions, has continued to be promoted within the department, wins medals for his research [and seems unaware his behaviour is problematic].</i>	
86	<i>I told my male PhD supervisor that I was not intending to stay in academia after my PhD. Later that day, in a meeting with my other (male) supervisor, he asked what my plans were for after my PhD. Before I could respond, the supervisor I had spoken to in the morning answered: "she's leaving academia, she'll get married and have children." Never, in our conversation that morning, had marriage or children been mentioned. That had nothing to do with why I left academia. His comments made me feel that, as a female who was choosing to leave academia, I was part of the problem with the female drop-out rate in academia. I bet he would not have made that comment if a male PhD student said they were leaving academia. And, if I do choose to get married and have children in the future, is that not my choice and my business?</i>	E Mt Sx
87	<i>Volcanology is not a very diverse field. When asking for support or even advice on entering the field is met by discrimination - i.e people who thought I should not even be considering this field option due to my ethnicity. At conferences I are not taken seriously either people just tend to not bother with you and make you feel as though you don't belong their. For someone who was obsessed with getting into this field I was let down by people who could have supported me.</i>	R FW E
91	<i>The design and execution of field work is almost always oblivious to the physical and emotional needs of anyone not cis het Male. So bathroom stops or pauses for more private wild bathroom stops have been neglected on trips led by Male leaders, and sometimes women. Seating in vehicles is very very limited which exacerbates my inflammatory disease and prevents movement needed to reduce limb swelling resulting in a lack of mobility. This leads to being left behind on later segments of trip, when I could have participated if accommodations were not dismissed. There are generic but pervasive.</i>	Fw Sx Ph E
94	<i>While in graduate school, in several courses with the same professor, I answered a question first and correctly, but was told I did not answer the question correctly because the professor didn't listen to my answer and/or assumed I wouldn't know the answer. When the next person (male) answered with the exact same answer, he was told, 'Exactly. That is the answer I was looking for.' As this was a math answer, it was not subject to interpretation.</i>	E Sx

96	<i>The [specific-country] volcanology community can be quite cliquy and there seems to be a bit of a culture of funding each other's proposals and those with the right academic "parentage" while displaying a real hostility to outsiders. This includes aggressive critique of conference presentations (including students), overly harsh or personal reviews of proposals and a general lack of respect when talking about other academics between themselves. It also leads to the same people repeatedly being awarded funding. I personally have been accused of knowing nothing about things I have written proposals on and advised to give my proposal to somebody more senior and concentrate on more junior level tasks. There is also very little recognition of the impact of sexual harassment on victims and a general culture of looking the other way. Perpetrators continue to be welcomed in academic settings, including giving oral presentations at conferences, ignoring the impact this has on those they harassed and their ability to participate in those same events.</i>	Fu Ma A Tx E W
97	<i>Sexism about the way I dressed and how that wasn't how scientists dressed</i>	Sx Pa E
98	<i>Arranging to go on a field trip with a supervision who needed to write a letter to facilitate the transportation who refused to do so without any explanation.</i> <i>Not being allowed to stay at designated observatory lodgings because it wasn't "fit" for females.</i> <i>Not being allowed on a field team because I wasn't "sting" enough or "male" to carry equipment.</i>	Fw Sx E
100	<i>During important meetings, it occurred several times that the options discussed previously with my boss (and on which we both agreed) were rejected publicly by the same boss when i presented them during the meetings</i>	P E
103	<i>In most of the international conferences or events in which I took part, native English-speaking people (or those who are comfortable with English) generally don't make any effort for local languages, which from my point of view a major discrimination (especially for students), sometimes underestimated.</i> <i>Anyway, good luck for your paper !</i>	L
104	<i>I witnessed a research geologist refer to Indigenous peoples as squaws. Where I'm from this is a very derogatory term for Indigenous peoples. They may not have known this. An intern and myself were referred to as incompetent for doing exactly what we were told to do. I'm clinically diagnosed with ADHD and take medication for it. Being called incompetent did nothing but make the imposter syndrome worse.</i>	R Mh W E
106	<i>Female graduate adviser openly and often limited male student opportunities, including me personally. She claimed she was "leveling the field," even in public forums. Complaints were met with threats of career destruction. All of this was in plain sight of administrators. She, of course, was promoted to [a much</i>	Sx E B

	<i>higher position] while her male students were lucky to survive graduate school. She also openly discriminated against those she thought were from a lower class.</i>	Soc W
110	<i>I heard 2 teachers speaking about not carrying a woman partner to a fieldwork because she was "annoying" because she was feminist and vegan.</i>	W Sx B
111	<i>In private and in public, I was subjected to work place bullying while studying for my master by a well respected volcanologist. This centred around my mental health and constant belittlement. This only added to my a severe period of depression, which led me to take a year off to recover.</i>	B Mh E
113	<i>This probably not want you want to hear, but the strongest forms of discrimination I have seen are in the form of preferences for women over men in academic jobs and for research funding (which is hard to document, but anecdotally appears to be true).</i> <i>My institution has institutionalized favoritism for women in administration and promotion and even stipulates that a woman's salary has to be higher than any man's salary of similar academic rank in each university department.</i>	W Sx Fu O
115	<i>I would say I've experienced (and witnessed) subtle forms of discrimination, and it's not always clear the reason. I'm a female in a male-dominated subfield, but some of the colleagues I've had trouble with seem fine working with other females. It could be having a non-standard background or not graduating from a well-known program. It could be personality, "culture", or other related characteristics outside the majority culture which I've noticed in others who are treated similarly. By "subtle forms", I mean things that aren't explicit and might not even be intended, such as dismissiveness, patronizing comments/actions, lack of interest, and seemingly endless hurdles to "prove" yourself. I've occasionally tried to address these concerns directly with colleagues or with a supervisor/manager and have usually been brushed off (e.g., 'they didn't mean it', 'they're nice and wouldn't do something like that') or given sympathy with no action or course for change (e.g., 'I'm sorry to hear that. I hope things get better.', 'I'm sorry and will do better next time' (then repeats the same action), 'It's me, not you. There's nothing you can do better.'). For my specific sub-discipline, at least in my country, it feels like it's a club where you have to know the 'right' people, act the "right" way, work on the 'right' topics, etc. to be included in it. Sometimes I think it's simply due an unconscious preference for "people like me". I can't think of any big or explicit incidences, but over years, the small things add up and can eat away at you. I'm pretty much at a point where I feel done with research careers, or at least my field/subfield, because I feel like what I do isn't really valued, that I don't "belong", and that I will always have to fight or do twice as much to get any acknowledgment or be taken seriously.</i>	E W Ma

116	<i>During fieldwork near the [a volcanic] eruption site, my less experienced colleague was harassed by police because he didn't wear helmet (not really needed [at the time]) although we had permits to be at the site. We were forced to leave while other people who were in the same positions as us, but maybe more senior-looking etc were allowed to stay.</i>	FW A W
117	<i>Few weeks ago we received negative comments of a journal reviewer because of the authors are from Latin America, and despite that provide some English feedback, do not provide a real criticism of the manuscript itself</i>	E L
120	<i>I have frequently seen and experienced how snr. Female colleagues use crying and lying and gossiping to poison the work climate and disadvantage other colleagues of all other genders. Worse yet, it is these toxic females that claim that they have been harrassed.</i>	W Sx
121	<i>Many female coworkers use their looks and female body parts to gather attention and influence over superiors and coworkers alike. This is soooo frequent that I can barely find words. as an introvert and oversized person (due to medication) this is leaving me frequently behind in selections for rewarding tasks and promotions. Skinny female coworkers are very often very cruel in this respect and not enough, they add insult to injury by frequently spreading gossip about oversized people as well.</i>	E Sx
122	<i>As a non-white man, being looked down upon by female colleagues for not coming from a European background. Female colleagues often received more help from both male and female colleagues than male colleagues. More funding and job opportunities were given to female colleagues and candidates. Female colleagues weren't being hold accountable when mistakes were made.</i>	E Sx R
124	<i>At my workplace we have a female lecturer from [a particular country] and she is nice on the surface, but behind people's backs she gossips and manipulates people to go against each other. When a senior (male) professor called her out she cried publicly and said she is oppressed and discriminated against, whereas actually it was her that was lying and manipulating others and made the life at the department a misery. She then filed a formal complaint against the professor, but luckily the legal department at the University rejected it as there was no convincing reason. After this, she claimed the University is not supporting females, which is not true at all. I am deeply troubled by this as I am a Muslim woman and I feel that these behaviors are against all good things on this Earth and also against my religion where this false behavior is not tolerated. I am very sad about this.</i>	W Tx
125	<i>Young male PhD students and researchers are actively being discriminated in our current system. Females are being strongly favored, simply to fill "quotas". This has nothing to do with a merit based system anymore, but with political agenda. This is not how research should work. Whoever is the most qualified should get the grant/job/prize. Furthermore, complaints of male researchers that experience discrimination from female researchers are being ignored, or they are being told to "suck it up". There is nothing more worthless than a young male in our academic system.</i>	W Sx

127	<i>When on maternity leave, some of my teaching was saved for me to do on my return.</i>	<i>E</i> <i>Mt</i>
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