



## Assessment of Diversity within IUGS Bodies

On behalf of the General Secretary of the IUGS, Prof. Stan Finney, an analysis of the diversity within the IUGS bodies was conducted in anticipation of the upcoming position renewals. The data for each IUGS body was provided by the Secretary General of the IUGS. This assessment was conducted using two indices to quantify gender diversity and geographical diversity in the composition of each IUGS body, facilitating also a comparison between them. The two indices are derived as follows:

a) **Gender Imbalance Index:**  $I_{GI} = N_w / (N_w + N_m)$ , where  $N_w$  is the number of women and  $N_m$  the number of men. Based on the data provided, it was not possible to include the presence of non-binary individuals in the assessment. Therefore, the index was calculated considering only the presence of women and men, and it was normalized to the total number of individuals in the group ( $N_w + N_m$ ). If gender is not explicitly indicated, each person will be assigned to one of the two categories (women or men) based on their first name.

$I_{GI}$	Description
0.00	Gender inequality (only men)
0.00-0.50	Gender imbalance with a predominance of men
0.50	Gender equality
0.50-1.00	Gender imbalance with a predominance of women
1.00	Gender inequality (only women)

b) **Geographical Diversity Index**<sup>1</sup>:  $I_{GD} = -\sum(p_i \cdot \ln(p_i + \epsilon))$ , where  $p_i$  is the number of individuals from geographical region  $i$  (North America, South America, Africa, Europe, Asia, Oceania) in the group and  $\epsilon$  is a small constant (0.0001) to prevent division by zero. This index helps to understand how evenly distributed the group members are across different geographical regions.

$I_{GD}$	Description
0.000	No diversity (all individuals are from the same continent)
0.000-1.791	From low to high diversity
1.791	Maximum diversity (equal representation of individuals from all continents)

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<sup>1</sup> The Shannon-Wiener Index, which is used to quantify ecological diversity, was employed to calculate the Geographical Diversity Index ([https://www.ableweb.org/biologylabs/wp-content/uploads/volumes/vol-27/22\\_Nolan.pdf](https://www.ableweb.org/biologylabs/wp-content/uploads/volumes/vol-27/22_Nolan.pdf), accessed 13 June 2024).

## Rating

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
CG	Commission on Geoethics	Governing Board	4	3	2	1	0	3	1	0	0.43	1.277
		Task Group on IUGS Ethical Guidelines	3	1	1	1	0	1	1	0	0.25	1.386
		Task Group on Diversity, Equity, Inclusivity, and Accessibility	2	3	2	0	0	1	1	1	0.60	1.332
		<i>Total</i>	9	7	5	2	0	5	3	1	<b>0.44</b>	<b>1.474</b>
CGGB	Commission on Global Geochemical Baselines	Steering Committee	5	10	1	2	2	8	1	1	<b>0.67</b>	<b>1.414</b>
CGI	Commission for the Management and Application of Geoscience Information	Council	8	4	1	1	1	4	3	2	<b>0.33</b>	<b>1.632</b>
COGE	Commission on Geoscience Education	Board	2	3	1	1	0	1	1	1	0.60	1.609

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Regular members	5	5	1	3	2	1	3	0	0.50	1.504
		Associated members	4	4	0	4	1	2	1	0	0.50	1.213
		<i>Total</i>	11	12	2	8	3	4	5	1	<b>0.52</b>	<b>1,617</b>
ICG	International Commission on Geoheritage	Executive Committee	2	2	0	0	0	3	1	0	0.50	0.562
		Sub-commission on Geological Heritage Sites – Officers	3	0	0	0	0	2	1	0	0.00	0.636
		Sub-commission on Geological Heritage Sites – Voting members	21	10	3	3	2	17	5	1	0.32	1.363
		Sub-commission on Heritage Stones - Officers	2	1	0	0	0	1	2	0	0.33	0.636
		Sub-commission on Heritage Stones – Voting members	17	8	1	5	0	17	1	1	0.32	0.970

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Sub-commission on Geo-collections - Officers	2	1	0	0	1	2	0	0	0.33	0.636
		Sub-commission on Geo-collections – Voting members	7	6	3	0	1	6	2	1	0.46	1.377
		<i>Total</i>	54	28	7	8	4	48	12	3	<b>0.34</b>	<b>1.300</b>
<b>INHIGEO</b>	<b>International Commission on the History of Geological Sciences</b>	Board of Management	5	6	2	1	1	5	1	1	<b>0.55</b>	<b>1.540</b>
		Executive	2	1	1	0	0	1	1	0	0.33	1.098
		Subcommission on Quaternary Stratigraphy (SQS) – Executive	1	2	0	0	0	2	1	0	0.67	0.636
<b>ICS</b>	<b>International Commission on Stratigraphy</b>	Subcommission on Quaternary Stratigraphy (SQS) – Voting	3(2)	4(2)	0	0	0	4(2)	2(1)	1	0.57	0.955

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Members										
		Subcommission on Neogene Stratigraphy (SNS) – Executive	1	2	2	0	0	1	0	0	0.67	0.636
		Subcommission on Neogene Stratigraphy (SNS) – Voting Members	11(10)	8(6)	3	1	0	13	1	1	0.42	1.016
		Subcommission on Paleogene Stratigraphy (SPS) – Executive	1	2	0	0	0	3	0	0	0.67	0.000
		Subcommission on Paleogene Stratigraphy (SPS) – Voting Members	10(9)	9(7)	1	2	1	13	1	1	0.47	1.116
		Subcommission on Cretaceous Stratigraphy (SCS) –	1	1	0	0	0	2	0	0	0.50	0.000

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			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Executive										
		Subcommission on Cretaceous Stratigraphy (SCS) – Voting Members	12(11)	6(5)	2	1	0	11	3	1	0.33	1.164
		Subcommission on Jurassic Stratigraphy (SJS) – Executive	3	1	0	0	0	2	2	0	0.25	0.693
		Subcommission on Jurassic Stratigraphy (SJS) – Voting Members	10(8)	10(9)	1	2	1	11	5	0	0.50	1.205
		Subcommission on Triassic Stratigraphy (STS) – Executive	2	1	0	0	0	1	2	0	0.33	0.636
		Subcommission on Triassic Stratigraphy (STS) – Voting Members	16(15)	4	4	1	1	10	4	0	0.20	1.289

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Subcommission on Permian Stratigraphy (SPeS) – Executive	2	1	0	0	0	2	1	0	0.33	0.636
		Subcommission on Permian Stratigraphy (SPeS) – Voting Members	12(10)	4(3)	3	1	0	9	2	1	0.25	1.244
		Subcommission on Carboniferous Stratigraphy (SCaS) – Executive	3	0	0	0	0	2	1	0	0.00	0.636
		Subcommission on Carboniferous Stratigraphy (SCaS) – Voting Members	15(12)	2	2	0	0	10	5	0	0.12	0.924
		Subcommission on Devonian Stratigraphy (SDS) – Executive	3	0	0	0	0	3	0	0	0.00	0.000



Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Subcommission on Devonian Stratigraphy (SDS) – Voting Members	9	6	2	0	0	10	2	1	0.40	0.988
		Subcommission on Silurian Stratigraphy (SSS) – Executive	2	1	0	0	0	3	0	0	0.33	0.000
		Subcommission on Silurian Stratigraphy (SSS) – Voting Members	8	3	2	0	0	7	2	0	0.27	0.907
		Subcommission on Ordovician Stratigraphy (SOS) – Executive	2	1	1	0	0	1	1	0	0.33	1.098
		Subcommission on Ordovician Stratigraphy (SOS) – Voting Members	8	8	3	2	0	6	4	1	0.50	1.461

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Subcommission on Cambrian Stratigraphy (SCamS) – Executive	1	2	1	0	0	0	0	2	0.67	0.636
		Subcommission on Cambrian Stratigraphy (SCamS) – Voting Members	14(13)	7(5)	7	1	0	8	3	2	0.33	1.380
		Subcommission on Ediacaran Stratigraphy (SES) – Executive	2	1	3	0	0	0	0	0	0.33	0.000
		Subcommission on Ediacaran Stratigraphy (SES) – Voting Members	13	5	7	1	0	5	5	0	0.28	1.239
		Subcommission on Cryogenian Stratigraphy (SCrS) – Executive	1	2	1	0	0	1	1	0	0.67	1.098

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Subcommission on Cryogenian Stratigraphy (SCrS) – Voting Members	14	6	5	2	0	7	4	2	0.30	1.496
		Subcommission on Precryogenian Stratigraphy (SPCrS) – Executive	1	2	1	2	0	0	0	0	0.67	0.636
		Subcommission on Precryogenian Stratigraphy (SPCrS) – Voting Members	16(15)	9(7)	6	4	3	7	1	4	0.36	1.668
		Subcommission on Stratigraphic Classification (SSC) – Executive	2	2	2	0	0	2	0	0	0.50	0.693
		Subcommission on Stratigraphic Classification (SSC) – Voting Members	15(13)	9(7)	9	1	0	12	1	1	0.38	1.111

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Subcommission on Timescale Calibration (STC) – Executive	2	1	2	0	0	1	0	0	0.33	0.636
		Subcommission on Timescale Calibration (STC) – Voting Members	17	16	17	1	0	11	4	0	0.48	1.069
		<i>Total</i>	219	124	82	20	6	165	54	16	<b>0.36</b>	<b>1.364</b>
TGIR	Task Group on Igneous Rocks	Board of Management	3	0	1	0	0	1	0	1	0.00	1.098
		Voting members	12	3	4	1	1	5	3	1	0.20	1.582
		<i>Total</i>	12	3	4	1	1	5	3	1	<b>0.20</b>	<b>1.582</b>
TGSG	Task Group on Submarine Geohazards	Executive Bureau	6	1	2	0	0	1	4	0	0.14	0.955
		Coordinators	16	4	2	2	1	7	7	1	0.20	1.494
		Consortia	44	13	4	4	4	16	23	6	0.23	1.519

Acronym	IUGS body	Group name	Gender*		Geography*						Index	
			Male	Female	North Amer.	South Amer.	Africa	Europe	Asia	Oceania	I <sub>GI</sub>	I <sub>GD</sub>
		Advisory organization	3	0	0	0	0	1	2	0	0.00	0.636
		<i>Total</i>	69	18	8	6	5	25	36	7	<b>0.21</b>	<b>1.494</b>
<b>Total IUGS</b>			392	212	112	49	23	269	118	33	<b>0.35</b>	<b>1.478</b>

\* Regarding data on ICS subcommissions, when counting the personnel belonging to different subcommittees, each person was considered as a separate member for each subcommittee to which they belong. In other words, if a person is on two subcommittees, this person was counted twice: once for each subcommittee. This approach allows for a clear view of the total number of members for each individual subcommittee, although it means that the overall number of unique individuals is less than the total counted, as some people are counted more than once.

# Ranking

The calculated indices were used to create two separate rankings for the IUGS bodies: one for gender equality and another for geographical equity. The gender equality ranking was defined by calculating the Gender Equality Index ( $I_{GE}$ ) based on the Gender Imbalance Index ( $I_{GI}$ ) (see below). The  $I_{GE}$  quantifies how close each IUGS body is to achieving gender equality. The geographical equity ranking is based on the values of Geographical Diversity Index ( $I_{GD}$ ) calculated for the IUGS bodies. The  $I_{GD}$  measures the level of geographical diversity within the governing community of each IUGS body.

## Gender Equality

Gender Equality Index:  $I_{GE} = |0.50 - I_{GI}|$

$I_{GE}$	Description
0.00	Gender equality
0.00-0.15	Gender imbalance – Low
0.15-0.35	Gender imbalance – Medium
0.35-0.50	Gender imbalance – High
0.50	Gender inequality

Position	Acronym	IUGS body	$I_{GE}$
1	COGE	Commission on Geoscience Education	0.02
2	INHIGEO	International Commission on the History of Geological Sciences	0.05

Position	Acronym	IUGS body	I <sub>GE</sub>
3	CG	Commission on Geoethics	0.06
4	ICS	International Commission on Stratigraphy	0.14
5	ICG	International Commission on Geoheritage	0.16
6	CGGB	Commission on Global Geochemical Baselines	0.17
6	CGI	Commission for the Management and Application of Geoscience Information	0.17
7	TGSG	Task Group on Submarine Geohazards	0.19
8	TGIR	Task Group on Igneous Rocks	0.30

		I <sub>GE</sub>
IUGS	International Union of Geological Sciences	0.15

## Geographical equity

Geographical Diversity Index:  $I_{GD} = -\sum(p_i \cdot \ln(p_i + \epsilon))$

$I_{GD}$	Description
0.000	No diversity (all individuals are from the same continent)
0.000-1.791	From low to high diversity
1.791	Maximum diversity (equal representation of individuals from all regions)

Position	Acronym	IUGS body	$I_{GD}$
1	CGI	Commission for the Management and Application of Geoscience Information	1.632
2	COGE	Commission on Geoscience Education	1.617
3	TGIR	Task Group on Igneous Rocks	1.582
4	INHIGEO	International Commission on the History of Geological Sciences	1.540
5	TGSG	Task Group on Submarine Geohazards	1.494



Position	Acronym	IUGS body	I <sub>GD</sub>
6	CG	Commission on Geoethics	1.474
7	CGGB	Commission on Global Geochemical Baselines	1.414
8	ICS	International Commission on Stratigraphy	1.364
9	ICG	International Commission on Geoheritage	1.300

		I <sub>GE</sub>
IUGS	International Union of Geological Sciences	1.478

## Conclusion

Globally, the IUGS demonstrates a good level of gender balance and satisfactory geographical diversity. However, there is room for improvement in enhancing involvement, particularly from South America and Africa, to further enrich its geographical representation.

## Regarding this report

This report was:

- drafted by Giuseppe Di Capua (Secretary of the Commission on Geoethics)
- reviewed and accepted by Silvia Peppoloni (Chair of the Commission on Geoethics)

Date: 13 June 2024