The centenary of IAVCEI 1919–2019 and beyond: origins and evolution of the International Association of Volcanology and Chemistry of the Earth's Interior

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Abstract

IAVCEI originated in 1919 as one of the six inaugural “sections” of the International Union of Geodesy and Geophysics (IUGG). IUGG was formed by the International Research Council, which has now evolved to become the International Science Council (ISC). In 1933 the Section for Volcanology was renamed the International Association of Volcanology (IAV), and in 1967, it became the International Association of Volcanology and Geochemistry of the Earth's Interior (IAVCEI). IAVCEI has been managed by 22 Presidents, 10 Secretaries-General, and their executive committees/bureaus. IAVCEI has always had a focus on facilitating the communication of volcanological research through organising a variety of international conferences, including IAVCEI General Assemblies, Scientific Assemblies, occasional Volcanological Congresses, and Cities on Volcanoes conferences. In addition, IAVCEI established research working groups initially which then became the association's research commissions. The research commissions have also organised their own research workshops. Recently IAVCEI has also developed new groupings of researchers through their Network program, including the Early Career Researcher Network, which focus mostly on facilitating communication. *Bulletin of Volcanology* has been the official IAVCEI journal since 1924 and has undergone several facelifts in its cover and format. It has been very well served by its 11 volunteer editors, editorial board, and reviewers in almost 100 years of publication. In addition, IAVCEI was instrumental in instigating an inventory of known volcanoes through its Catalogue of the Volcanoes of the World series, a role now undertaken by the Smithsonian Institution. To acknowledge outstanding achievements in volcanological research, IAVCEI has established 6 awards since 1974. Developing a better understanding of how volcanoes erupt and the impacts of eruptions on society has been an integral responsibility of IAVCEI as the learned international association in volcanology. In the 1990s, IAVCEI initiated the Decade Volcanoes program to encourage research on 16 volcanoes that were deemed to pose significant risks to the communities around them. Some have erupted since then, but eruptions from other volcanoes have also provided significant insights into eruption processes and phenomena. Although IAVCEI's future looks healthy, there are ways of being more proactive in improving services to members, including improving diversity and inclusiveness, greater gender balance for all positions on the IAVCEI Executive Committee, widening the representation of nationalities that serve on the Executive Committee, increasing membership numbers to generate greater income to support scientists in need of support to participate in IAVCEI activities, and significantly lowering the fee for open access publication of research papers in IAVCEI's masthead journal, *Bulletin of Volcanology*.

Keywords IAVCEI · History · Committee personnel · *Bulletin of Volcanology* · Editors · Commissions · Conferences · Decade volcanoes

This paper constitutes part of a topical collection:

IAVCEI 1919-2019: One hundred years of international outreach and scientific advances in Volcanology

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Introduction: the beginnings

The International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) had its beginnings in 1919 following the end of World War I as part of an international initiative to foster collaboration in the physical sciences. Then known as the Section of Volcanology (SV), it

was one of the six founding member associations, or sections as they were called then, of the International Union for Geodesy and Geophysics (IUGG), which was formed in 1919 (Gasparini and Johnson 1995; Ismail-Zadeh 2016). Previous summaries of the origins and history of IAVCEI include a short summary by Gasparini and Johnson (1995) and a more comprehensive overview by Cas (2019), upon which this current paper is based and significantly expanded upon.

To understand IAVCEI's context within IUGG, and the relationships of both IAVCEI and IUGG to other important scientific organisations, a brief review of the historical evolution of international co-operation of the physical sciences follows. Prior to World War I, a level of international co-operation in the physical sciences had been established through the collaborations of national academies of science in 19 European countries and the USA, under the umbrella of the International Association of Academies (IAA; Greenaway 1996; Ismail-Zadeh 2016). However, the outbreak of World War I interrupted the activities of IAA in fostering international co-operation. At the end of WWI in 1918, representatives of national academies from the allied nations held meetings in Britain and Paris to establish the International Research Council (IRC), which continued to foster international co-operation in the sciences under this name until 1931, when it was renamed the International Council of Scientific Unions (ICSU; Greenaway 1996; Ismail-Zadeh 2016).

IRC held its first General Assembly from 18 to 28 July 1919 in Brussels, Belgium, and was attended by representatives from Australia, Belgium, Brazil, Canada, France, Greece, Italy, Japan, New Zealand, Poland, Portugal, Romania, Serbia, South Africa, the UK, and the USA (Lyons 1919; Ismail-Zadeh 2016). At that first IRC assembly, it was decided to establish two unions of geosphere-related sciences, the International Astronomical Union and the International Union of Geodesy and Geophysics (IUGG), which had been discussed at the Paris 1918 meeting (Ismail-Zadeh 2016). IUGG was thus constituted in July 1919 in Brussels, and it brought together six geoscientific disciplines, five of which had existed as independent scientific organisations prior to WWI—geodesy, terrestrial magnetism and electricity, meteorology, physical oceanography, seismology, as well as volcanology (Ismail-Zadeh 2016), which does not appear to have had a formal international organisational presence prior to this. These scientific disciplines were initially called “sections” of IUGG. IAVCEI was therefore initially called the Section of Volcanology (SV) of IUGG when it was constitutionally formed in 1919 (Gasparini and Johnson 1995).

ICSU was renamed the International Council for Science (ICS) in 1998 and existed until 2018 when it merged with the International Social Sciences Council (ISSC), to form the International Sciences Council (ISC), which is

the peak international science organisation for developing international policy and advice on scientific matters to international organisations (e.g. UNESCO) and countries. ISC is an umbrella organisation for “40 international scientific Unions and Associations and over 140 national and regional scientific organisations including Academies and Research Councils” (ISC website: <https://council.science/about-us/>). IUGG is one of those unions, and IAVCEI is a member association of IUGG. As a member of IUGG, IAVCEI can thus influence international science policy through ISC.

IAVCEI as a member association of IUGG

Formed in 1919, IUGG (<http://www.iugg.org/>) held its first General Assembly, or scientific conference, in 1922, in Rome, Italy, and subsequent IUGG General Assemblies have been held about every 4 years (Table 1). IUGG General Assemblies involve scientific research symposia organised by each scientific association or section, as well as joint symposia between associations, and business meetings (e.g. election of new committees and consideration of scientific policy matters). The first IUGG General Assembly in 1922 was therefore also the first General Assembly of the Section of Volcanology (i.e. IAVCEI). At the 1922 IUGG General Assembly, a new section, hydrology, was added as a scientific discipline of IUGG, making seven sections. Then at the 5th IUGG General Assembly in Lisbon, Portugal, in 1933, the “Sections” of IUGG were renamed “Associations”, and so the Section of Volcanology became the International Association of Volcanology (IAV; Gasparini and Johnson 1995). At the 14th IUGG General Assembly in Zurich, Switzerland, in 1967, IAV became the International Association of Volcanology and Geochemistry of the Earth's Interior (IAVCEI), in recognition of the importance of geochemistry and geochronology in understanding volcanic processes. With the addition of the Association of Cryospheric Science (IACS), at the 24th IUGG GA in Perugia, Italy, in 2007, IUGG was then made up to 8 associations. IAVCEI, and IUGG, celebrated their Centenary together at the 27th IUGG General Assembly in Montreal, in 2019. As it is now constituted, IUGG consists of the following eight associations:

- International Association of Cryospheric Sciences (IACS)
- International Association of Geodesy (IAG)
- International Association of Geomagnetism and Aeronomy (IAGA)
- International Association of Hydrological Sciences (IAHS)
- International Association of Meteorology and Atmospheric Sciences (IAMAS)
- International Association for the Physical Sciences of the Oceans (IAPSO)

Table 1 IUGG general assemblies, years, locations, and attendance numbers (source: IUGG website <http://www.iugg.org/assemblies/>). Note: the attendance numbers reflect all delegates from all the IUGG associations, not just from IAVCEI, which organises its GAs within the structure of IUGG GAs

Conference no.	Year	Location	Attendance no. (total IUGG, not just IAVCEI)
I	1922	Rome, Italy	?
II	1924	Madrid, Spain	?
III	1927	Prague, Czechoslovakia	?
IV	1930	Stockholm, Sweden	331
V	1933	Lisbon, Portugal	200
VI	1936	Edinburgh, Scotland	344
VII	1939	Washington, USA	805
VIII	1948	Oslo, Norway	368
IX	1951	Bruxelles, Belgium	918
X	1954	Rome, Italy	923
XI	1957	Toronto, Canada	1165
XII	1960	Helsinki, Finland	1375
XIII	1963	Berkeley, USA	1938
XIV	1967	Zurich, Switzerland	2200
XV	1971	Moscow, Russia	2577
XVI	1975	Grenoble, France	2564
XVII	1979	Canberra, Australia	1944
XVIII	1983	Hamburg, Germany	3204
XIX	1987	Vancouver, Canada	3939
XX	1991	Vienna, Austria	4331
XXI	1995	Boulder, USA	4481
XXII	1999	Birmingham, UK	4052
XXIII	2003	Sapporo, Japan	4151
XXIV	2007	Perugia, Italy	4375
XXV	2011	Melbourne, Australia	3392
XXVI	2015	Prague, Czech Republic	4231
XXVII	2019	Montreal, Canada	3715
XXVIII	2023	Berlin, Germany	

- International Association of Seismology and Physics of the Earth's Interior (**IASPEI**)
- International Association of Volcanology and Chemistry of the Earth's Interior (**IAVCEI**)

These associations all have representatives (the Presidents) on the IUGG Executive Committee and so contribute to policy decisions of IUGG. The Secretaries-General of the associations work together with the Secretary-General of IUGG to organise the IUGG General Assemblies, which are also the General Assemblies for all the associations. In addition to the program of symposia that each association has at each IUGG GA, there are also inter-association symposia,

involving two or more associations on themes of common interest.

The evolution of IAVCEI

The founding fathers who formed IAVCEI in 1919

The movers and shakers who established the Section for Volcanology in IUGG in 1919 were Annibale Ricco (Italy), Alfred Lacroix (France), Henry S. Washington (USA), and Alessandro Malladra (Italy) (Gasparini and Johnson 1995; Cas 2019; Fig. 1). Annibale Ricco (Fig. 1a), from Italy, was a celebrated astronomer, with interests in other natural sciences, including seismology. He served as an astronomer at the universities of Modena, Naples, Palermo, and Catania, all in Italy. Alfred Lacroix (Fig. 1b), was a French mineralogist and volcanologist who is famous for his account of the 1902 eruption of Mt. Pelée, which killed ~30,000 people in the coastal town of St Pierre, Martinique, and for defining the concept of nuées ardentes (“glowing clouds” or

Fig. 1 Key personnel responsible for the formation of IAVCEI. **a** Annibale Ricco, first President; **b** Alfred Lacroix, first co-Vice President and second President; **c** Henry S. Washington, first co-Vice-President; **d** Alessandro Malladra, first Secretary-General, third President, and first Editor of *Bulletin Volcanologique*

pyroclastic flows). Lacroix was a Professor at the Museum of Natural History in Paris. According to Wikipedia, Lacroix was only permitted to graduate with a doctorate by his supervisor, Ferdinand Fouque, if Lacroix married Fouque's daughter! Henry S. Washington (Fig. 1c) was a famous petrologist and geochemist at the Carnegie Institution for Science in Washington DC, who was integral to introducing the CIPW Normative composition concept. HS Washington was from the lineage of George Washington, was financially well endowed, and was able to undertake scientific research as a hobby until 1906. However, during a field trip in 1906, his wife of 13 years absconded with most of his fortune, after which he worked as a mining geologist for income until 1912, when he joined the Carnegie Institution (Milton 1991). Washington never married again. Washington was a very able, charismatic, and influential person in science in the USA and internationally. Alessandro Malladra (Fig. 1d) was a "naturalist", interested in many areas of science, especially glaciers. He was appointed as an assistant to Giuseppe Mercalli, Director of the Osservatorio Vesuviano (Vesuvius Observatory), in Naples, Italy, in 1911 and was appointed its Director in 1927.

At the Inaugural IRC meeting in Brussels in 1919 when both IUGG and SV were formed, Annibale Ricco (Italy) became the first President of the Section for Volcanology, Alfred Lacroix (France) and Henry Washington (USA) were joint Vice-Presidents, and Alessandro Malladra (Italy) was appointed Secretary-General. The process of appointment is not clear, but it is likely that it was by the consensus of the movers and shakers involved in setting up the Section for Volcanology. Sadly, Ricco died only 2 months into his term as President. Lacroix took over the duties of President de facto but was not formally installed as President until the first SV/IAVCEI and IUGG General Assembly in Rome in 1922, at which Washington became Vice-President and Malladra was confirmed as Secretary-General.

IAVCEI's initial activities

The first official scientific meeting of the Section of Volcanology occurred as part of the 1922 IUGG General Assembly, held in Rome, Italy, at which scientists from around the world presented their research and reports and discussed volcanological issues. Unfortunately, the number of participants was not recorded, but representatives came from Belgium, Canada, France, Great Britain, Italy, Japan, Norway, Portugal, Spain, Sweden, Switzerland, and the USA (Gasparini and Johnson 1995).

At that General Assembly, it was decided to establish a bureau or office for the Section of Volcanology in Naples, Italy, where Malladra was based. As Secretary-General, Malladra oversaw the introduction of *Bulletin Volcanologique* (BV), the official journal of SV and the precursor

to *Bulletin of Volcanology*. The French title was adopted because French was the dominant of the two official languages of the IUGG, the other being English. BV was first published in 1924, with Alessandro Malladra as the editor, a role in which he continued until 1936, in addition to that of being Secretary-General of SV.

Governance: structure and statutes of IAVCEI

Structure and functions

IAVCEI is managed by an elected committee called the IAVCEI Executive Committee (EC) or Bureau (B), the members of which are elected by registered members of IAVCEI (see below). The EC/B manages the day-to-day operations of IAVCEI including its finances, membership matters, organisation, and financial support for IAVCEI conferences either directly or by liaison with national organising groups, financial support for members with limited finances to attend IAVCEI conferences and workshops, the IAVCEI research commissions and the early career network, the IAVCEI Awards program, the editorship of IAVCEI's flagship journal, *Bulletin of Volcanology*, the relationships with the publisher of *Bulletin of Volcanology*, Springer, and liaison with IUGG.

A focus of the research activities of IAVCEI is the research commissions (see below), which are groups of scientists with similar research interests in volcanology who facilitate collaboration on specific research themes. Any member of IAVCEI can join the commissions and participate in their governance and activities, such as independent workshops or conferences, and thematic symposia at the major IAVCEI conferences.

Finances of IAVCEI

Currently IAVCEI receives an annual capitation grant from IUGG, as do all IUGG associations, that is based on the number of IAVCEI members who attend the IUGG General Assemblies. IUGG in turn receives an annual grant from the UNESCO to operate, as well as receives annual membership fees from IUGG member countries. It is unclear when the capitation fee support grant was first introduced by IUGG for its member associations. Until 1995 these IUGG capitation fees were the only source of finances for IAVCEI. The IUGG capitation fees remain IAVCEI's principal source of income, and so it is crucial that IAVCEI members attend the IAVCEI GAs to ensure it receives a substantial capitation income from IUGG. In its early years, IAVCEI received grants from the UNESCO and the Italian Research Council to support the publication of *Bulletin Volcanologique* (see below).

In 1995, IAVCEI instituted personal membership for IAVCEI requiring payment of a membership fee scaled to the income of members and the socio-economic status of the countries they come from. In return, IAVCEI members were given voting rights to elect members of the IAVCEI Executive Committee or Bureau. In addition, IAVCEI often receives a negotiated sum or proportion of the total registration fees or of the surplus after all costs are paid from its major conferences, for which it will often provide “seed money” to help with initial stages of organisation and promotion. Finally, IAVCEI receives small sums of money from sales of its occasional books published under agreements with the Geological Society of London and Springer.

IAVCEI executive committee or bureau positions

The principal officers of IAVCEI since 1919 have been its Presidents and Secretaries-General, with each Secretary-General also being the treasurer. All Presidents and Secretaries-General have been males. In addition, a committee, consisting of two Vice-Presidents, the Immediate Past President (ex officio), and four other elected committee members, contributed to discussions on IAVCEI matters. In 2019 a newly elected position of Early Career Researcher position was added to the committee. The current committee/bureau membership is listed on the IAVCEI website (<https://www.iavceivolcano.org/about-iavcei/executive-committee/>), and a list of all known past IAVCEI Executive/Bureau Committee members is available in the Appendix. (NOTE: Some names of some committee members in the period 1927 to 1975 are missing. Information on these would be appreciated.)

Despite being an international association, executive committee membership consisted exclusively of scientists from Europe and the USA until 1963. After 1963 the nationalities represented slowly diversified to include several members from Japan, Australia, New Zealand, the Philippines, Mexico, South Africa, and eventually other Latin American countries (Brazil, Ecuador, Puerto Rico; Appendix).

No women were on the IAVCEI Executive Committee/Bureau before 1995 (Appendix). (A little uncertainty arises about the gender of some committee members whose given names are represented only by initials in available records, although it is suspected that they were males.) In 1995 Marta Mantovani (Brazil) was elected as the first female committee member of IAVCEI. During 1995–2003 and 2011–2015, there was only one woman on the committee, two from 2003–2011, and three from 2011–2023. Only three women have been elected as Vice President (J McPhie, Australia, 2003–2007; A Grunder, USA, 2007–2011; J Lindsay, New Zealand, 2019–2023). No woman has been elected President of IAVCEI, whereas women have been Presidents of the other associations of IUGG. Clearly more nominations of women and their election for all executive/bureau positions

are required for IAVCEI to be seen to be sufficiently gender inclusive, and there is no regulatory impediment in IAVCEI against their involvement.

The lengths of committee terms have varied in the past, but since 1963, the terms for President have been 4 years, and to provide continuity in committee membership, for the Secretary-General, 8 years. Committee members can be re-elected for only one further 4-year term, but they may be nominated for the Presidency or Secretary-General position thereafter. All committee positions are voluntary, and the IAVCEI community is indebted to those who have given their time to serve as committee members.

IAVCEI Presidents and Secretaries-General

The major workload in managing and co-ordinating the activities of IAVCEI falls on the President and the Secretary-General. The presidents and secretaries-general of IAVCEI since 1919 are listed in the Appendix, together with other committee members, and they are collated in Table 2, together with their terms of office and country affiliations, and images are shown in Figs. 2 and 3, respectively.

IAVCEI has had 22 Presidents since 1919 (Table 2; Fig. 2). Since 1954 President has had one 4-year term, and since 1960, this has been prescribed by the statutes of IAVCEI (<https://www.iavceivolcano.org/about-iavcei/statute-and-by-laws/>). Prior to this, the length of the term varied, influenced for a period by World War II. IAVCEI has had 10 secretaries-general during its history (Table 2; Fig. 3). Since 1960, the terms of secretaries-general have been 8 years, as prescribed by the statutes of IAVCEI. There were only two secretaries-general in the first 41 years that IAVCEI existed. The first, Alessandro Mallandra, officiated from 1919 to 1936 (17 years) and the second, Francesco Signore, from 1936 to 1960 (24 years). Italian secretaries-general controlled much of IAVCEI's destiny for the first 48 years of its existence, probably because the IAVCEI administrative office was located in Naples, Italy. (Also see comments below on the editorship of BV.)

Election of IAVCEI executive committee/bureau by IAVCEI members and introduction of personal membership

The IAVCEI Executive Committee is now elected by IAVCEI members in the months before each IAVCEI and IUGG General Assembly, after an open call for nominations from IAVCEI to its members. The election is conducted by an Election Oversight Committee appointed by the President, and usually chaired by the past President, two terms earlier. The editor of the *Bulletin of Volcanology* is appointed by the Executive Committee after an open call for expressions of interest.

Table 2 Presidents and Secretaries-General of IAVCEI, years, and country affiliations. (source: IUGG website <http://www.iugg.org/publications/yearbooks/yearbook2021.pdf>, p. 45; IAVCEI website <https://www.iavceivolcano.org/about-iavcei/executive-committee/past-officers/>; Cas 2019). Also see Fig. 2 for images of the presidents and Fig. 3 for images of the secretaries-general

Years	President, country	Years	Secretary-General, country
1919–1922	Annibale Riccò (Italy)	1919–1936	Alessandro Malladra (Italy)
1922–1927	A. Alfred Lacroix (France)	1936–1960	Francesco Signore (Italy)
1927–1933	Alessandro Malladra (Italy)	1960–1967	Francesco Penta (Italy)
1933–1936	Constantine A. Ktenas (Greece)	1967–1975	Pierre Evrard (Belgium)
1936–1948	Auguste Michel-Lévy (France)	1975–1983	Peter E. Baker (UK)
1948–1954	Berend G. Escher (Netherlands)	1983–1991	Hans-Ulrich Schmincke (Germany)
1954–1963	Alfred Rittmann (Switzerland/Italy)	1991–1999	R. Wally Johnson (Australia)
1963–1967	Hisashi Kuno (Japan)	1999–2007	Steve R. McNutt (USA)
1967–1971	Gordon A. MacDonald (USA)	2007–2015	Joan Martí (Spain)
1971–1975	Georgii S. Gorshkov (USSR)	2015–2023	Roberto Sulpizio (Italy)
1975–1979	Robert W. Decker (USA)		
1979–1983	Sergei A. Fedotov (USSR)		
1983–1987	Ian G. Gass (UK)		
1987–1991	Shigeo Aramaki (Japan)		
1991–1995	Paolo Gasparini (Italy)		
1995–1999	Grant Heiken (USA)		
1999–2003	Stephen J. Sparks (UK)		
2003–2007	Oded Navon (Israel)		
2007–2011	Setsuya Nakada (Japan)		
2011–2015	Raymond Cas (Australia)		
2015–2019	Donald Dingwell (Germany)		
2019–2023	Patrick Allard (France)		

Prior to 1995, it seems that IAVCEI Committees were “agreed to” the following enquiries by the outgoing Executive Committee about suitable candidates who were representative of the IAVCEI community. As required by IUGG statutes, committee members could only be chosen from representatives, called national correspondents, nominated by the national academies of science (or equivalent) from countries that were financial member countries of IUGG, to represent those countries on matters relevant to IAVCEI. In 1995, under the Presidency of Grant Heiken, the IAVCEI Executive Committee introduced personal membership, irrespective of their country of origin, in order to develop a stronger sense of international inclusivity, to help raise funds for the many meetings and workshops that IAVCEI organised every year, which could not be adequately funded by annual budget allocations from IUGG, and to provide a sounder financial base for publication of the *Bulletin of Volcanology*. As a result, all IAVCEI members became eligible to be nominated and to vote for candidates for the IAVCEI Executive Committee.

Officially, IUGG did not support individual membership or membership fees in the IUGG associations nor the election of scientists from non-financial member countries of IUGG to the committees of IUGG associations. There had been many tense exchanges between IAVCEI and the IUGG Executive before and after the 1995 IAVCEI declaration on individual membership. The problems with the restrictive

IUGG scheme for appointing association committees were many, including the disenfranchisement of many volcanologists who were very active in IAVCEI, but came from countries that were not financial members of IUGG. This was clearly unfair in an increasingly modern, inclusive, and democratic world, and given that most poor countries were not financial members of IUGG, yet many had numerous active volcanoes and large volcanological communities. So, in defiance of IUGG statutes, from 1995 onwards, IAVCEI Executive Committees were elected by all members of IAVCEI irrespective of their countries of residence.

Unfortunately, this meant that according IUGG statutes, IAVCEI Executive Committees could be declared illegitimate by IUGG if it chose. To overcome this constitutional impasse, the IAVCEI Executive Committee of 2011–2015 supported President Ray Cas and Secretary-General Joan Martí in undertaking a difficult and again at times tense campaign to convince IUGG and its other member associations of the merits of allowing associations to formally introduce individual membership, the charging of membership fees, and democratisation of the elections of association executive committees, if they so wished. This involved allowing all registered members, irrespective of country of residence, to be eligible to nominate candidates, to be nominated as a candidate, and to participate in the election of the committees. At one stage, IAVCEI held a plebiscite to consider seceding from IUGG if these basic democratic principles were

Fig. 2 Images of the Presidents of IAVCEI since 1919. Also see Table 2. **a** Annibale Ricco. President for only 2 months in 1922 before dying. **b** Alfred Lacroix 1922–1924–1927. **c** Alessandro Malladra 1927–1933. **d** Constantine A. Ktenas 1933–1936. **e** Auguste Michel-Lévy 1936–1948. **f** Berend Escher 1948–1954. **g** Alfred Rittmann 1954–1963. **h** Hisashi Kuno 1963–1967. **i** Gordon A. MacDonald 1967–1971. **j** Georgii S. Gorshkov 1971–1975. **k** Robert W. Decker 1975–1979. **l** Sergei A. Fedotov 1979–1983. **m** Ian G. Gass 1983–1987. **n** Shigeo Aramaki 1987–1991. **o** Paolo Gasparini 1991–1995. **p** Grant Heiken 1995–1999. **q** Stephen J. Sparks 1999–2003. **r** Oded Navon 2003–2007. **s** Setsuya Nakada 2007–2011. **t** Raymond Cas 2011–2015. **u** Donald Dingwell 2015–2019. **v** Patrick Allard 2019–2023 (see next page for continuation of Fig. 2)

not agreed to. The IAVCEI membership voted overwhelmingly (93% of >600 votes cast) to take that course of action if IUGG did not agree to our proposal. The proposal was overwhelmingly supported by the IUGG Council at the 2015 IUGG General Assembly in Prague, after it was realised that two other associations also already had a form of personal membership in place, demonstrating that “the times they are a’changin’”. In addition, IAVCEI demonstrated that it was by far the most active association in IUGG in terms of conferences, workshops, and short courses, which it could only do using funding generated by personal membership fees.

The only position now on the IAVCEI Executive Committee that must be filled by a representative from an IUGG financial member country is that of the President. This was a concession to IUGG, since the finances of IUGG, and thus the associations, which all receive an annual monetary allocation from IUGG, are largely derived from the subscriptions paid to IUGG by member countries, from the budgets of the national academies of science of those countries. The perceived benefit of being a country member of IUGG is the right to contribute to the formulation of scientific policy at an international level through IUGG, and then through ICSU, now ISC.

Fig. 2 (continued)

From 1995 to 2015, the election of the IAVCEI Executive Committee was conducted by hardcopy ballot papers and snail mail. The elections of the 2015–2019 and 2019–2023 IAVCEI Committees were successfully and securely conducted electronically online.

IAVCEI secretariat and communication with membership

The IAVCEI Secretary-General (SG) has always had the overall responsibility for managing the day-to-day affairs of IAVCEI including the finances, membership, communication with members, and the journal. Much of this work has been done out of the SG's normal working institutional office. However, right from the outset, it was recognised that a base office was required, and so the first SG, Alessandro Malladra, set up a secretariat office in Naples, Italy, in 1922, which existed until 1984. After 1984 and until 2017, the IAVCEI secretariat moved with each change in SG and basically operated out of the office of the SG. This created problems with the financial management of IAVCEI's assets, particularly with its banking needs, requiring transfer of funds internationally every 8 or so years, and assessment of the taxation implications and status of IAVCEI as a not for profit organisation, which had to be proved in each country.

During the term of Don Dingwell as President and Roberto Sulpizio as SG (2015–2019), the demands of the secretariat were assessed as being beyond what is reasonable for an unpaid, volunteer SG to undertake on top of their normal

paid employment. It was also realised that IAVCEI would have to become more professional and sophisticated with its communication process and develop social media platforms for communicating with much of its membership, especially younger members, about its activities and opportunities. It was thus decided in 2017 to engage Guarant, a professional management company based permanently in Prague in the Czech Republic to become IAVCEI's secretariat, with responsibility for managing IAVCEI's finances, memberships and quarterly newsletter under the direction of the IAVCEI Secretary-General, and digital communications, website, and newsletter design under the direction of the IAVCEI communications director and website manager, Eugenio Nicotra. Needless to say, IAVCEI pays a fee for this, but examination of the IAVCEI website (<https://www.iavceivolcano.org/>) and newsletters (<https://www.iavceivolcano.org/newsletter/>) shows how much more professional the presentation of IAVCEI as an international research association has become. In addition to the newsletter, IAVCEI now can communicate almost instantaneously with linked members on Facebook (<https://www.facebook.com/IAVCEI/>), Twitter (https://twitter.com/iavcei_official), and Instagram (<https://www.instagram.com/iavcei/?hl=en>).

IAVCEI statutes and by-laws

The first mention of statutes (or constitution), made by Gasparini and Johnson (1995), refers to statutes that were

Fig. 3 Images of the Secretaries General of IAVCEI since 1919. Also see Table 2. **a** Alessandro Malladra 1922–1936. **b** Francesco Signore 1936–1960. **c** Francesco Penta 1960–1967. **d** Pierre Evrard 1967–1975. **e** Peter E. Baker 1975–1983. **f** Hans-Ulrich Schmincke 1983–1991. **g** R. Wally Johnson 1991–1999. **h** Steve R. McNutt 1999–2007. **i** Joan Martí 2007–2015. **j** Roberto Sulpizio 2015–2023

adopted at the 1960 IAV/IUGG General Assembly in Helsinki, Finland, for what was then still the International Association of Volcanology (IAV). It is assumed that prior to this, IAV statutes mirrored those of IUGG, although information on this is lacking. Following these 1960 statutes, IAV's scientific activities were managed through four internal "sections", Active Volcanoes, Volcano-Physics, Physics and Chemistry of Magmas, and Paleovolcanology, the Presidents of which were members of the IAV Bureau/Executive Committee.

At the IUGG General Assembly in Zurich in 1967, IAV was renamed IAVCEI, and more flexible Working Groups on topical research themes were introduced to replace the more rigid sections. There was then a further revision of IAVCEI's statutes at the 1979 IAVCEI/IUGG General Assembly, in which "Working Groups were replaced by Commissions and Task Groups, the former having the aim of promoting and co-ordinating scientific activity on large research themes on a permanent basis, the latter being focused on temporary

problems or on frontier areas of volcanological research" (Gasparini and Johnson 1995).

In 1995 at the IAVCEI/IUGG General Assembly in Boulder, USA, and again in revised statutes passed at the 2011 IAVCEI/IUGG General Assembly in Melbourne, Australia, the concept of individual scientists becoming "affiliates" of IAVCEI and "making donations" (aka paying membership fees) was introduced. At the 2015 IUGG General Assembly in Prague, Czech Republic, IAVCEI proposed to the IUGG Council that all eight IUGG associations be able to offer individual membership to scientists from all countries, involving fee payment. The motion was overwhelmingly passed by the national delegates of the 60 financial member countries of IUGG, even though it was not favoured by the IUGG Executive Committee. IAVCEI included formalised individual membership in revised statutes, which were adopted by the IAVCEI membership at its 2015 business meeting in Prague and are available on the IAVCEI website (<https://www.iavceivolcano.org/about-iavcei/structure-and-laws/>).

The stated goals and mission of IAVCEI

The 2015 IAVCEI statutes outline the objectives of IAVCEI as follows:

1. To promote the study of volcanoes, volcanic processes, and their deposits, past and present, and of the chemistry of the Earth's interior
2. To encourage, initiate, and coordinate research and to promote international co-operation in these studies
3. To arrange for the dissemination and discussion of research results and policy matters on volcanology at major conferences (IAVCEI General Assemblies, IAVCEI Scientific Assemblies, Cities on Volcanoes Conferences) and Research Commission Workshops and Field Workshops
4. To arrange for the publication of the results of scientific research on volcanology and on the chemistry of the Earth's interior through its dedicated journal, *Bulletin of Volcanology*, and book series
5. To encourage volcanologists to alert appropriate authorities to the importance of adequate surveillance of active and potentially active volcanoes and of volcanic risk assessment
6. To be the international reference body for advice on scientific policies relating to volcanic processes, hazards, and risks
7. To provide guidelines to professional volcanologists on protocols and principles in the conduct of their work, and to help them understand their responsibilities, the expectations, and consequences of their actions, in their countries of employment and service.
2. All scientists who become individual members of scientific learned societies or associations should be able to participate in the activities of such societies or associations, including attendance at conferences and other activities, voting on matters that are brought to the membership, nominating others for committee positions, being nominated for committee positions, and serving in those capacities if voted in by the membership.
3. Membership of a learned society or association may only be rejected or cancelled if the candidate or member has been guilty of (i) professional malpractice; (ii) discrimination against others on the grounds of age, cultural background, race, religion, political or scientific views, disability, gender, gender orientation, country of origin, country of residence, or financial status of those countries in the learned society or association, or (iii) bringing the society or association into disrepute by unfairly maligning it.
4. Disagreeing with the policies of the association or society in good faith is not deemed to malign the learned society or association but represents the democratic right of any member of an enlightened learned society or association to state their views.

Principle of freedom of participation in learned societies

IAVCEI's successful proposal to allow IUGG associations to introduce individual membership for all scientists at the IUGG General Assembly in 2015 involved the enunciation of a new "Principle of Freedom of Participation in Learned Societies" that was also incorporated into the new IAVCEI Statutes of 2015. It states:

IAVCEI adheres to the Principle of Freedom of Participation in Learned Societies for all scientists:

1. All scientists should be able to apply for, and be accepted for individual membership of scientific learned societies or associations, and should be able to participate freely irrespective of age, cultural background, race, religion, political or scientific views, disability, gender, gender orientation, country of origin, country of residence, or financial status of those countries in the learned society or association.

The role of IAVCEI in providing guidelines for professional volcanologists involved in volcanic crisis management

Following the 2009 L'Aquila earthquake disaster in Central Italy, and the convictions of six scientists of the Italian National Serious Risks Commission for criminal manslaughter (they were subsequently acquitted on appeal), the IAVCEI Executive Committee undertook a review of the implications for volcanologists involved in monitoring volcanic hazards and risks in professional capacities in their countries. At the initiative of IAVCEI President Ray Cas, supported unanimously by the IAVCEI Executive Committee, IAVCEI made representations to the Italian President and Prime Minister, IUGG, and other organisations to have the convictions overturned based on understanding of the historically very high levels of seismicity and previous earthquake disasters in the L'Aquila region of Italy, the scientific difficulty of predicting major, damaging earthquakes, the lack of apparent legal guidelines on the liability of the scientists in serving on the advisory committee, and in the light of the apparent weakness of Italian building standards to the appropriate level for the earthquake prone region, or the enforcement of such standards. Although IAVCEI is not a workers' union for professional volcanologists, the IAVCEI Executive Committee felt that it had an obligation to ensure that its members are aware of their legal vulnerabilities as professional volcanologists should loss of life

and infrastructure occur during a volcanic event that they have responsibility for.

IAVCEI had already played a role in raising awareness of these issues amongst its members in 1999 in a paper by Newhall et al. published in the *Bulletin of Volcanology* titled “Professional conduct of scientists during volcanic crises” (Bull. Volcanol. 60:323–334) produced by IAVCEI’s Subcommittee for Crisis Protocols; the link to which is <https://link.springer.com/content/pdf/10.1007/PL00008908.pdf>.

That paper identified the many vulnerabilities that a practicing volcanologist could be subject to and provided a checklist of questions they and their organisations should ask themselves with regard to the various responsibilities of their positions. That document did not consider legal liabilities or provide specific guidelines on what actions should be taken to minimise personal liability. The L’Aquila disaster clearly pointed out the need for IAVCEI to revisit the 1999 report in this regard.

Guido Giordano from Italy was invited to organise an open discussion session on the professional responsibilities of volcanologists, their vulnerabilities, and potential liabilities at the Cities on Volcanoes 8 conference in Yogyakarta, Java, Indonesia in 2014. Guido arranged to co-ordinate this session through the IAVCEI Commission on Volcanic Hazards and Risk.

Some of the issues discussed included:

- What are the expectations of professional volcanologists?
- What is the level of responsibility of their decision-making?
- Who are they accountable to?
- Who is responsible for communication of hazard and risk assessments to government, civil authorities, the media, and the general population?
- How should an assessment be presented—as a statistical likelihood, as a range of scenarios with assessment of the worst-case consequences of each scenario, or the most likely scenario?
- Is there a personal legal liability for decisions and assessments made and what are these?
- Are there clear guidelines in place in each country so that professionals clearly understand the personal level of responsibility and the personal consequences of their assessments?

Guido then co-ordinated a IAVCEI Task Group including members of the Commission, others involved in volcanic crisis management and Chris Newhall, lead author of the 1999 IAVCEI report, that then produced the current “IAVCEI Guidelines on the Roles and Responsibilities of Scientists Involved in Volcanic Hazard Evaluation, Risk Mitigation and Crisis Response” available at <https://www.iavceivolcano.org/iavcei/iavcei-guidelines-on-the-roles-and-responsibi>

[lities-of-scientists-involved-in-volcanic-hazard-evaluation-risk-mitigation-and-crisis-response/](#). These guidelines were endorsed by IAVCEI members at the IAVCEI business meeting during the IUGG General Assembly in Prague, Czech Republic, in 2015.

IAVCEI’s major conferences, their locations, years, and attendance numbers

IAVCEI has organised international volcanology conferences since 1922, evolving over the years to include three main conferences, General Assemblies (GA), Scientific Assemblies (SA), and Cities on Volcanoes conferences (CoV), as well as occasional Volcanological Congresses (VC). The GA conferences are held as part of IUGG General Assemblies and have been held about every 4 years, excepting during World War II (Table 1). In between the general assemblies, IAVCEI has held its own Scientific Assemblies (SA) and Volcanological Congresses (Table 3). Attendances at SA/VCs have progressively increased from ~500 in 1977 at the Durham, UK SA, to >1,000 at the 2013 Kagoshima SA and 1,400 at the 2017 Portland SA. There was however a decrease in numbers immediately after the global financial crisis of 2008. Over the last 20 years, a new thematic conference, initiated by the Commission for Cities and Volcanoes and called “Cities on Volcanoes”, has become very popular, attracting over 600 people at recent conferences (Table 4). These are held about every 2 years. All conferences are held in different locations and countries, the venue based on interested countries competing to host each conference.

IAVCEI general assemblies

Since 1922, IAVCEI’s General Assemblies have been held as part of the IUGG General Assemblies in conjunction with the other associations of IUGG (Table 1). General Assemblies serve as both scientific research meetings where new research is presented in a series of symposia and workshops, as well as business meetings where new committees are inducted, reports from the outgoing IAVCEI Executive Committee are presented to members, and awards for research excellence are presented and celebrated. GA’s also allow for joint inter-disciplinary research symposia with other IUGG associations. GAs have occurred about every 4 years, and the timing, locations, and known total combined number of delegates from all IUGG associations attending the General Assemblies (<http://www.iugg.org/assemblies/>) are presented in Table 1. No GA was held during World War II, but in general, attendance numbers progressively increased over time, except for the 2011 GA in Melbourne, which was affected by the economic impact of the Global

Table 3 IAVCEI Scientific Assemblies and Volcanological Congresses (VC), years, locations, and attendance numbers. (Source: IUGG website <http://www.iugg.org/meetings/assemblies.php>; IAVCEI website <https://www.iavceivolcano.org/events/page/2/?past>; IAVCEI Newsletters)

Conference no.	Year	Location	Attendance no.
I	1977	Durham, UK (joint with IASPEI)	500
II	1982	Reykjavik, Iceland	190
III	1986	Auckland-Rotorua, New Zealand (VC)	?
IV	1989	Santa Fe, USA (VC)	?
V	1990	Mainz, Germany (VC)	?
VI	1991	Napoli, Italy	800
VII	1993	Canberra, Australia	600
VIII	1994	Ankara, Turkey (VC)	?
IX	1997	Puerto Vallarta, Mexico	600
X	1998	Cape Town, South Africa (VC)	?
XI	2000	Bali, Indonesia (VC)	490
XII	2004	Pucon, Chile	936
XIII	2006	Guangzhou, China (VC)	?
XIV	2008	Reykjavik, Iceland	907
XV	2013	Kagoshima, Japan	1069
XVI	2017	Portland, USA	1400
XVII	2023?	Rotorua, New Zealand	

Financial Crisis of 2008–2010. A further factor affecting attendance at the 2011 Melbourne GA was ironically the eruption of Puyehue-Cordón Caulle volcano in Chile in mid-2011, which began the week before the start of the conference, causing an ash cloud to blanket much of South America, so preventing many registered delegates from South America from attending the conference due to airport closures and flight cancellations. The XXVIIIth General Assembly is scheduled for 2023 in Berlin, Germany.

IAVCEI Scientific Assemblies and Volcanological Congresses

IAVCEI's Scientific Assembly and Volcanological Congress conferences are organised as IAVCEI stand-alone

Table 4 IAVCEI Cities on Volcanoes conferences, years, locations, and attendance numbers. (Source: IAVCEI website <https://www.iavceivolcano.org/events/?past>)

Conference no.	Year	Location
I	1998	Rome and Napoli, Italy
II	2001	Auckland, New Zealand
III	2003	Hilo, Hawaii
IV	2006	Quito, Ecuador
V	2007	Shimabara, Japan
VI	2010	Tenerife, Spain
VII	2012	Colima, Mexico
VIII	2014	Yogyakarta, Indonesia
IX	2016	Puerto Varas, Chile
X	2018	Napoli, Italy
XI	2022?	Heraklion, Crete

conferences. They occur between the General Assemblies and from available records only seem to have commenced in 1977; they have been held approximately every 4 years since then (Table 3; IUGG website: <http://www.iugg.org/meetings/assemblies.php>; IAVCEI website: <https://www.iavceivolcano.org/events/page/2/?past>). IAVCEI Scientific Assemblies have a research focus with numerous thematic symposia, workshops, and fieldtrips. They also celebrate research achievements by individuals and groups through presentation of research awards. In addition, Volcanological Congresses (VC), which also have a research focus but lack a research awards component, have occurred at irregular times (Table 3) but have not been organised since 2006.

The forthcoming 17th Scientific Assembly was originally scheduled for 2021 in Rotorua, New Zealand, but was postponed to 2022 due to limitations on international travel and health risks resulting from the global COVID-19 pandemic and has again been rescheduled to 2023 due to the pandemic.

IAVCEI cities on volcanoes conferences

IAVCEI's Commission on Cities and Volcanoes has now organised 10 "Cities on Volcanoes" (CoV) conferences (Table 4). These tend to emphasise consideration of volcanic hazard, eruption monitoring, and civil response issues than the GAs and SAs. The first CoV was organised in 1998 and subsequently every 2 or 3 years (Table 4; <https://www.iavceivolcano.org/meeting-courses/past-iavcei-meetings.html>). The 11th CoV conference, scheduled to be held in Heraklion, Cyprus, in 2020, has also been postponed several times due the COVID-19 pandemic and is currently scheduled to be held in 2022.

IAVCEI commission meetings and workshops

In addition, IAVCEI's Research Commissions (see below) have organised many other conferences, workshops, and field workshops all over the world, sometimes in association with GAs, SAs, and CoV conferences, but often as stand-alone events, making IAVCEI one of the most active associations in IUGG. Commissions also propose and host many of the research symposia at GAs and SAs.

Bulletin Volcanologique and Bulletin of Volcanology (BV)

Origins and history

IAVCEI has produced its own journal since very early in its history, initially called *Bulletin Volcanologique* from 1924 to 1984 and renamed *Bulletin of Volcanology* from 1986 on. *Bulletin of Volcanology* was thus 97 years old at the time of writing. The first volumes were released spasmodically, and in a confusing manner, in two Series. Volume I, Series I, has eight issues/parts, six of which were released over 2 years in 1924–1925 (Fig. 4a), and the last, issue 8, in 1931. However, on the *Bulletin of Volcanology* website of Springer, there is a Volume 1 listed as published in 1937, and then Volume 2, with two issues, issue 2 dated as published in 1926, and issue 1 in 1937! The break from 1931 to 1937 presumably represents the impact of international monetary instabilities in the late 1920s leading to the Great Depression of the early 1930s, with Series II beginning in 1937. Volumes 3 and 4 (of Series II) were published in 1938, Volume 5 in 1939, and Volumes 6 and 7 in 1940. As a result of World War II (1939–1945), no volumes of BV were published after 1940, and the first post-WW II volume appeared in 1949 (vol. 8). BV was published relatively regularly thereafter, although there were some unexplained gaps in 1957, 1961, 1977, and 1985. No volume numbers were however skipped; their publication was just delayed. The cover of post-World War II volumes are also labelled Series II, suggesting that after the initial Volume I (Series I, 1924–1936), the clock was reset in 1937, with the commencement of Series II, beginning with another Volume 1.

The source of funding to support publication of BV in the early years is unclear, but in the 1950s to early 1960s, funding was provided by the UNESCO, and then during the 1960s and 1970s by the National Research Council of Italy, as acknowledged on the covers of BV. From the mid-1980s, after publication was handed over to Springer in Germany, funding was provided by IAVCEI and was also sourced from journal subscriptions, which continues to be the case to the present.

For over 40 years from 1924 to 1966, the Secretary-General of IAVCEI was also the editor of BV. That changed after 1966, but all editors of BV until 1986 were Italian, largely because the office or bureau of IAVCEI was in Naples. After 1986 scientists from other nationalities became editors of BV. In 1975, at the IAVCEI General Assembly in Grenoble, France, it was decided that the processes by which BV was produced needed to be more rigorous, and so a more inclusive international peer-review process for research papers was established, with Volume 39 in 1976, edited by Franco Barberi and F. Esu Cugusi, being the first output under this new regime. It is unclear how reviewing of manuscripts prior to this was undertaken, but presumably largely by the editor. Dissatisfaction amongst the IAVCEI community with the slowness of reviewing and processing of papers and publication of research papers came to a head in the mid-1980s, and a decision was made to transfer publication of BV to Springer in Germany, coinciding with the appointment of the first non-Italian editor of BV, Hans-Ulrich Schmincke, who was also the Secretary-General of IAVCEI at the time, and was instrumental in the change in direction.

When BV was renamed as *Bulletin of Volcanology* in 1986 and handed over to Springer for production, the journal format was redesigned. The journal took on a new look with the release of Volume 48 (Fig. 4b) and since then has been continuously produced as a high-quality international journal. From time to time, its format has been revised and refreshed by each new editor (e.g. Fig. 4c, d). The current relationship between the IAVCEI appointed editor of BV and Springer, the current publisher, involves liaison between the editor and an assigned journal manager at Springer who helps the editor and IAVCEI to develop and oversee journal policy, content, performance, and ethical and legal issues (including plagiarism and self-citation). The editor works closely with the Springer journal manager through regular meetings, and who is always there for support, to oversee any problems and to help enforce industry-mandated code of conduct, publishing standards and ethics.

BV is now one of the two main-stream international volcanological journals, the other being the *Journal of Volcanology and Geothermal Research* (published by the independent, commercial science publisher Elsevier), which was initiated in the 1970s as a result of dissatisfaction in the international volcanological community with the processes and timescales associated with BV at the time. Other journals with a focus on volcanology have also emerged more recently (e.g. *Journal of Applied Volcanology*; *Volcanica*, the only diamond open access journal in volcanology).

Fig. 4 Four versions of the cover of BV **a** *The first!* Volume 1, no. 1, July–September 1924. Apart from slight changes in font, the design remained very similar up to volume 47, published in 1984. **b** Volume 48, no. 5, 1986. **c** Cover design of the last hardcopy version of BV, this issue being Volume 72, no. 4, 2010. **d** The current e-cover of BV, highlighting the eye-catching logo of IAVCEI

Editors of Bulletin Volcanologique and Bulletin of Volcanology

The editors of Bulletin of Volcanology are the unsung heroes of IAVCEI! Their efforts, as volunteers, in publishing research by the volcanological community on behalf of IAVCEI have long been undervalued. It is with the gratitude of the volcanological community that their identity (Table 5, Fig. 5) and contributions to our science are celebrated.

Until the review of Cas (2019), IAVCEI did not even have a consolidated record of who the editors of BV have been or their years of service. That information was only available on the covers of hardcopies of individual issues of BV until 2013. It was difficult to access that information for several reasons. First, when the multiple issues of the journal were bound into single year volumes for institutional libraries, often the covers of each issue in a volume, which have the editorial information, were deleted during the binding. Secondly, since the availability of digital copies of the journal,

Table 5 Editors and Deputy Editors (DE) or Editorial Administrator (EA) of *Bulletin Volcanologique* and *Bulletin of Volcanology*, their years of tenure, and their country affiliations. Notes: The first name in each time span is the principal editor, and only their images are shown in Fig. 5

Years of tenure	Names and country affiliations
1924–1936	Alessandro Malladra (Italy; also Secretary-General SG of IAVCEI)
1936–1959	Francesco Signore (Italy; also SG)
1959–1966	Francesco Penta (Italy; also SG)
1967	F. Esu Cugusi (Italy) – G. Marinelli (DE; Italy)
1968–1975	F. Esu Cugusi (Italy) – M. Mittempergher (DE; Italy)
1976–1984	Franco Barberi (Italy) – F. Esu Cugusi (DE; Italy)
1986–1989	Hans-Ulrich Schmincke (Germany; also SG) – Steve Sparks (DE; UK)
1990–1992	Hans-Ulrich Schmincke (Germany; also SG) – Gail Mahood (DE; USA)
1993–1996	Hans-Ulrich Schmincke (Germany; also SG)
1996–1999	Don Swanson (USA) – Chris Newhall (DE; USA)
2000–2003	Tim Druitt (France) – Jean Francois Lenat (DE; France)
2004	John Stix (Canada) – Jean Francois Lenat (DE; France)
2005–2010	John Stix (Canada) – JR Clark (EA; Canada)
2011–2017	James White (New Zealand) – Linda White (DE; New Zealand)
2017	Andrew Harris (France) – Laura Pioli (DE; Italy) – Jacopo Taddeucci (DE; Italy) – Frances van Wyk de Vries (EA; France)

Fig. 5 Images of the Editors of *Bulletin Volcanologique* and *Bulletin of Volcanology*. Also see Table 5. **a** Alessandro Malladra 1924–1936. **b** Francesco Signore 1936–1959. **c** Francesco Penta 1959–1966. **d** F. Esu Cugusi 1967–1975 (image not available). **e** Franco Barberi 1976–1984. **f** Hans Ulrich Schmincke 1986–1996. **g** Don Swanson 1996–1999. **h** Tim Druitt 2000–2003. **i** John Stix 2004–2010. **j** James White 2011–2016. **k** Andrew Harris 2017–

many people and institutions disposed of their hardcopies. It is also unfortunate that digital copies of BV do not now list who the editor is or was for each volume, back beyond the current editor.

For 60 years, the editorship of BV was undertaken by Italian volcanologists (Table 5; Fig. 5). Although there was some criticism of this perceived monopoly, it should also be acknowledged and applauded that the costs of producing BV were largely borne by the Italian National Research Council, with some grants also received from the UNESCO. In the late 1960s and 1970s, there was some frustration in the international volcanological community about the delays in processing, reviewing, and publishing BV, but it was not until 1986 when the editorship of BV was made more inclusive of the whole international community and rotated regularly thereafter. Since 1924 there have been eleven editors of *Bulletin of Volcanology*, but none have been women.

Unfortunately, there is no systematic record of the members of the editorial boards of *Bulletin of Volcanology*. In acknowledgement of their services, the countless members of the editorial board as well as reviewers of the manuscripts submitted to BV over the years are gratefully thanked.

A clearer structure of the editorial structure of *Bulletin of Volcanology* has emerged over the last two decades. For 25 years now, editorship of *Bulletin of Volcanology* has been undertaken on a rotating basis which today has evolved to include an Executive Editor (aka Editor in Chief), two Deputy Editors (to share the workload and deal with cases where the Executive Editor is conflicted), and an Administrator to manage handling of all submitted manuscripts (Table 5). Twenty to thirty Associate Editors, each with varying expertise in the volcanological subdisciplines, and reflecting gender, race, country, region, and Early Career balance, provide support for the Executive Editor in distributing manuscripts for review. The Associate Editors thus provide liaison between authors and the Executive Editor.

Publishers of Bulletin Volcanologique/Bulletin of Volcanology and years

BV has been published by only two publishers in its 97-year history. *Bulletin Volcanologique* was published by Francesco Giannini e Figli, in Naples, Italy, from 1924 to 1984, encompassing volumes 1 to 47; *Bulletin of Volcanology* has been published by Springer, in Germany, from 1986 to present, accounting for volumes 48 to 83 at the time of writing (<https://www.springer.com/journal/445>).

From hardback only to digital only: the changing face of Bulletin Volcanologique/Bulletin of Volcanology

From 1924 to 2013, BV was published in hardcopy and in the first part of the twenty-first century in both hardcopy and digital version. From 2013 it became available only in digital form online through the Springer BV website (<https://www.springer.com/journal/445>) or through institutional libraries. BV has been redesigned numerous times since first published in 1924. The principal incarnations of the cover from 1924 to the current online e-cover are represented in Fig. 4a–d.

Some Bulletin of Volcanology publication statistics

Details of the numbers of manuscript submitted, accepted, and published were unfortunately not kept historically until 2014 (Supplementary Information 1). Submissions averaged about 150 per year from 2014 to 2019 but dipped to 118 in 2020 in the aftermath of the COVID-19 global pandemic. Forty to 70% of manuscripts submitted per year have been accepted for publication, and those published vary between 45 and 75% of submitted manuscripts annually (Supplementary Information 1), but these percentages include papers submitted in 1 year but published in another. Similarly, data on numbers of countries represented by lead authors of submitted papers were not kept until 2011. The data (Supplementary Information 2) show that lead authors from 67 countries have published papers in BV from 2011 to 2020.

Catalogue of the Active Volcanoes of the World and Bulletin of Volcanic Eruptions

When IAVCEI was formed in 1919–1922, an initial goal was to establish a record of all the known active volcanoes around the world (Gasparini and Johnson 1995). However, little was done until 1947 when WQ Kennedy (UK) and JE Richey (UK) published a first attempt to catalogue and produce a map of the known volcanoes of the world as a supplement in Volume 7 of *Bulletin Volcanologique* (Kennedy and Richey 1947). At the 1948 IAVCEI-IUGG General Assembly in Oslo, Norway, it was decided to build on the database of the catalogue and map of the volcanoes produced by in 1947, by subdividing the world into 19 regions, with the aim of producing a catalogue for each, under the editorship of M. Neumann van Padang (Gasparini and Johnson 1995). These

Table 6 *Catalogue of the Active Volcanoes of the World* volumes, regions covered, and bibliographic details

Volume	Region	Authors
1	Indonesia	Neumann van Padang M (1951) Indonesia. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 1: 271p
2	Philippine Islands	Neumann van Padang M (1953) Philippine Islands and Cochin China. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 2: 49p
3	Hawaiian Islands	Macdonald GA (1955) Hawaiian Islands. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 3: 37p
4	Africa and the Red Sea	Richard JJ, Neumann van Padang M (1957) Africa and the Red Sea. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI 4: 118p
5	Melanesia	Fisher N H (1957) Melanesia. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 5: 105p
6	Central America	Mooser F, Meyer-Abich H, McBirney AR (1958) Central America. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 6: 146p
7	Kurile Islands	Gorshkov GS (1958) Kurile Islands. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 7: 99p
8	Kamchatka, continental Asia	Vlodavetz VI, Piip BI (1959) Kamchatka and Continental Areas of Asia. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 8:110p
9	USA (Yellowstone)	Coombs HA, Howard AD (1960) United States of America. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 9:68p
10	Antarctica	Berninghausen WH, Neumann van Padang M (1960) Antarctica. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 10:32p
11	Japan, Taiwan, Marianas	Kuno H(1962) Japan, Taiwan and Marianas. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 11:332p
12	Greece	Georgalas GC (1962) Greece. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 12:40p
13	Kermadec, Tonga, Samoa	Richard JJ (1962) Kermadec, Tonga and Samoa. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 13:38p
14	Archipelago de Colon, Isla San Felix and Islas Juan Fernandez	Richards AF (1962) Archipelago de Colon, Isla San Felix and Islas Juan Fernandez. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 14:50p
15	Chile	Casertano L (1963) Chilean Continent. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 15:55p
16	Arabia and Indian Ocean	Neumann van Padang M (1963) Arabia and the Indian Ocean. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 16:64p
17	Turkey and the Caucasus	Blumenthal MM, van der Kaaden G, Vlodavetz VI (1964) Turkey and Caucasus. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 17:23p
18	Italy	Imbo G (1965) Italy. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 18:72p
19	Colombia, Ecuador, Peru	Hantke G, Parodi I (1966) Colombia, Ecuador and Peru. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 19:73p
20	West Indies	Robson GR, Tomblin J (1966) West Indies. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 20:56p
21	Atlantic Ocean	Neumann van Padang M, Richards AF, Machado F, Bravo T, Baker PE, Le Maitre RW (1967) Atlantic Ocean. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 21: 1-128
22	New Zealand	Nairn IA, Cole JW (1975) New Zealand. <i>Catalog of Active Volcanoes of the World and Solfatara Fields</i> , Rome: IAVCEI, 22: 1-156

were published through the IAV/*Bulletin Volcanologique* bureau in Naples, Italy, and between 1951 and 1975, 22 volumes were produced (Table 6).

In 1961 the Volcanological Society of Japan undertook a program to record annually the eruptions and locations for that year. Their reports were appended to volumes of *Bulletin Volcanologique*. At least 33 volumes were

produced up to 1994. Since 1975, the role of providing updates has been largely undertaken by the Smithsonian Institution Museum for Natural Science, WA, USA, which has produced three editions of “Volcanoes of the World”, edited by Simkin et al. (1981, 1994) and Siebert et al. (2011).

The Smithsonian Institution Museum of Natural History also now provides a constantly updated on-line catalogue of volcanoes of the world, through its Global Volcanism Program (GVP) (<https://volcano.si.edu/>). For each volcano, there is a record of eruptions, reports, location map, and images. The website also provides an up-to-date list of current eruptions. In addition, the Smithsonian Institution GVP, in collaboration with the United States Geological Survey, Arizona State University, Portland State University, and IAVCEI, releases a weekly email report (VOLCANO: Smithsonian/USGS Weekly Volcanic Activity Report) as part of the weekly email Volcano Digest that summarises the activity level, eruption events, and crisis management status for volcanoes worldwide that are currently active or in a state of unrest. This report is distributed through an email news service called volcano listserv, which was initiated by the Arizona State University under the stewardship of Jonathan Fink in 1994. It continues to provide this service to the volcanological community, and in addition, it also disseminates information about meetings and news raised by members. IAVCEI members wanting to receive this weekly eruption update should contact Volcano@lists.asu.edu

IAVCEI newsletter

In addition to *Bulletin of Volcanology*, IAVCEI has had a newsletter for several decades that was initially snail-mailed to members but is now released on the IAVCEI website every 3 to 4 months. “IAVCEI News” summarises past, current, and future activities of IAVCEI, including conferences, workshops, and the activities of commissions. It also acts as a forum to raise issues affecting IAVCEI and its membership. Traditionally, the Secretary-General produced IAVCEI News, but from 2011 to 2016, it was compiled by Karoly Németh, from Massey University, New Zealand, who was instrumental in refreshing the newsletter when he became editor in 2011. Since IAVCEI contracted GUARANT to act as its secretariat in 2017, IAVCEI News has been produced by SG Roberto Sulpizio, web and communications manager, Eugenio Nicotra, and GUARANT staff. In addition to IAVCEI News, IAVCEI communicates episodically with members using digital social media and occasional announcement emails.

IAVCEI research commissions, working groups, task groups, and networks

Research Commissions are now an integral part of the fabric of all IUGG Associations. They consist of groups of scientists who have a common interest in a particular research theme or problem. IAVCEI has a large number of commissions, most of which are active, organising their own workshops and symposia as parts of IAVCEI’s major conferences, as well as independently between IAVCEI’s major conferences.

According to Gasparini and Johnson (1995), the aim of commissions was to promote and co-ordinate scientific activity on large themes on a permanent basis, whereas Task Groups would focus “on temporary problems or on frontier areas of volcanological research” over a finite period (Gasparini and Johnson 1995). Since 2019, IAVCEI has also introduced groups called Networks, which act to link and facilitate communication between groups of people interested in a particular aspect of IAVCEI or science, but without the need to focus on a specific research theme.

Commissions and working/task groups have had varied longevity, depending on their level of activity, and especially the leadership of these groups. Working/task groups have addressed specific issues and then ceased to operate. An important example of the role of Task Groups and Commissions is the role played by the 2013 to 2015 IAVCEI Task Group on Crisis Protocols, led by Guido Giordano, Italy, and the Commission on Volcanic Hazards and Risk in producing new guidelines for volcanologists involved in volcanic crisis management, as discussed above. Some commissions have become defunct or been decommissioned or resurrected under new leadership after some time of inactivity, and so the nature and themes of commissions have changed. The current list of IAVCEI Commissions operating in 2021 and guidelines for their operation are listed on the IAVCEI website: <https://www.iavceivolcano.org/commissions-networks/>.

Interestingly, one of the first thematic areas of research or investigation (an informal commission or working group?) undertaken by IAVCEI in 1924 was one on Submarine Volcanism, focussing largely, but not exclusively, on activity in the Indonesia archipelago, then part of the Dutch East Indies. There were regular reports in *Bulletin Volcanologique* in a specifically titled section on submarine volcanic activity listed in the contents of the first volumes.

The IAVCEI Commissions website lists the IAVCEI Commissions, inter-association Commissions that IAVCEI shares with other IUGG associations, and Networks that are active as of 2021 (<https://www.iavceivolcano.org/commissions-networks/>), but also listed in Supplementary Information 3 as a time capsule list, because the website listing

Table 7 Wager award medallists, the year of award, and the country of habitation at the time of the award. (Source: <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/wager-medal/>)

Year	Medallist	Country
1974	Franco Barberi	Italy
1974	J Varet	France
1978	RSJ Sparks	UK
1987	Charlie Bacon	USA
1993	Colin Wilson	UK
1993	Claude Jaupart	France
1998	Giovanni Macedonio	Italy
1998	Jon Davidson	USA
2002	Andrew Woods	UK
2002	James Gardner	USA
2004	Andrew Harris	USA
2004	Oleg Melnik	Russia
2008	Joachim Gottsmann	UK
2008	Alessandro Aiuppa	Italy
2011	Amanda Clarke	USA
2013	Antonio Costa	Italy
2013	Fidel Costa	Singapore
2015	Tommaso Esposti Ongaro	Italy
2015	Mattia de' Michieli Vitturi	Italy
2017	Marie Edmonds	UK
2017	Yan Lavallée	UK
2019	Madeleine Humphrys	UK

will change as various entities become inactive or new ones are initiated.

Early career network

In 2013 IAVCEI instigated an Early Career Research (ECR) network to cater to the needs of postgraduate students, post-doctoral researchers, and early career academics in establishing contacts and networks of like minds early in their careers. By engaging with the ECR Group and giving it a visible status in IAVCEI, the executive committee of IAVCEI wanted to establish a communication link with ECRs to help them develop a better understanding of IAVCEI, how it works, be involved in the decision-making processes, and how engaging in IAVCEI conferences and workshops would be beneficial to their careers. A successful scoping workshop was held at the 2013 Kagoshima IAVCEI General Assembly in Japan, together with another at the 2015 Prague General Assembly in the Czech Republic, followed by an evening ECR dinner to which a number of older scientists were invited as mentors. In 2018, the ECR Network Group was invited to develop a new logo for IAVCEI, and through a competition, IAVCEI's current logo was developed. The prime movers to help instigate the IAVCEI ECR Network

were Charlotte Vie (Early Career Scientist, UK) and Sam Poppe (then Postgraduate Student, Belgium). The ECR Network website address is <https://ecrnet.iavceivolcano.org/>.

IAVCEI awards

In the latter half of its history, IAVCEI introduced several awards to recognise outstanding scholarly and professional achievements.

Wager Medal

The first IAVCEI award, introduced in 1974, was for excellence in research. It was named the *Wager Medal*, after RL Wager (1904–1965), a petrologist at Oxford University, most famous for his seminal research on the petrological architecture and origins of the massive Skaergaard layered intrusive complex in Greenland. Although originally awarded every 4 years through a collaboration with the Royal Society of London, “the medal is (now) given every two years (i.e. at both Scientific and General Assemblies), to a scientist up to 15 years after Ph. D acquisition, who has made outstanding contributions to volcanology, particularly in the eight-year period prior to the Award” (IAVCEI Website). Multiple nominations are usually received in each round. Past

Table 8 Thorarinsson medallists, year of award, and country of habitation at the time of the award (<https://www.iavceivolcano.org/guidelines-for-iavcei-awards/thorarinsson-medal/>)

Year	Medallist	Country of habitation
1987	Robert L Smith	USA
1989	George PL Walker	UK
1993	Hans Ulrich Schmincke	Germany
1997	Richard V Fisher	USA
2000	Keiiti Aki	USA/France
2004	Wes Hildreth	USA
2008	R Stephen J Sparks	UK
2013	Barry Voight	USA
2017	Bruce F Houghton	USA

Table 9 Krafft Medal awardees, the year of the award, and the country of habitation at the time of the award (Source: <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/krafft-medal/>)

Year	Medallist	Country of habitation
2004	Tom Simkin	USA
2008	Christopher G. Newhall	USA
2013	Shigeo Aramaki	Japan
2017	Hugo Delgado Granados	Mexico
2017	Marta Calvache	Colombia

awardees are listed in Table 7 and at <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/wager-medal/>.

Thorarinsson Medal

In 1987, IAVCEI introduced the *Thorarinsson Medal* sponsored by the Geological Society of Iceland. Named after the famous Icelandic volcanologist Sigurdur Thorarinsson (1912–1983), the award is made “every four years at the IAVCEI Scientific Assembly to a scientist of outstanding distinction who has made fundamental contributions to research in volcanology” (IAVCEI website). Past awardees are listed in Table 8 and at <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/thorarinsson-medal/>.

Krafft Medal

The *Krafft Medal*, introduced in 2004, is named after the French husband and wife team Maurice and Katia Krafft, who were tragically killed by the ash cloud surge of a block and ash flow during an eruption of Mt. Unzen in Japan in 1991, together with another volcanologist, Harry Glicken, and 40 people from the media. The Medal is sponsored through a trust fund established by the Krafft family and “is awarded every four years at the IAVCEI Scientific Assembly to an individual who has made outstanding contributions to volcanology through service to the scientific community or to communities threatened by volcanic activity. The Krafft Medal honours those who have shown altruism and dedication to the humanitarian and applied sides of volcanology and those who have made selfless contributions to the volcanological community” (<https://www.iavceivolcano.org/guidelines-for-iavcei-awards/krafft-medal/>). Past awardees are listed on the IAVCEI website (<https://www.iavceivolcano.org/guidelines-for-iavcei-awards/krafft-medal/>) and in Table 9.

Table 10 Winners of the George Walker Award, year of the award, and the country of habitation at the time of the award (Source: <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/george-walker-award/>)

Year	Awardee	Country of habitation
2004	Costanza Bonadonna	Switzerland
2008	Diana C. Roman	USA
2008	Fukashi Maeno	Japan
2011	Josef Dufek	USA
2013	Heather Wright	USA
2015	Anja Schmidt	UK
2017	Sébastien Biass	Singapore
2017	Alexa Van Eaton	USA
2019	Damien Gaudin	France
2019	Fabian Wadsworth	UK

George Walker Award

This award honours George PL Walker, originally from the UK, and eventually Hawai‘i, USA, whose largely field-based research modernised and pioneered a quantitative approach to understanding volcanic eruptions, especially explosive eruptions. The award was introduced in 2004 and “is given every two years to a scientist up to seven years after Ph. D acquisition”. The award recognises achievements of a recent outstanding graduate in the fields of research encompassed by IAVCEI or also a recent graduate whose achievements in volcanology involved operating in difficult circumstances (IAVCEI website). The award is sponsored from a trust fund established by the Walker family. Past awardees are listed at <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/george-walker-award/> and in Table 10.

The Fisher Medal

The *Fisher Medal* is in honour of Richard V. Fisher (1928–2002), who made major contributions to understanding the behaviour of pyroclastic density currents, based largely on field studies of their deposits. “The medal is given every four years at the IAVCEI Scientific Assembly to a scientist who has made outstanding contributions to volcanology based primarily upon field observations”. The medal was introduced in 2017, and to date, the only awardee is listed below and at <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/fisher-medal/>.

- 2017 José Luis Macías Vázquez (Mexico)

Volcanic Surveillance and Crisis Management Award

“The *Volcanic Surveillance and Crisis Management Award* honors the institutions or organisations and their personnel responsible for monitoring volcanoes (volcano observatories and/or other institutions) that have made a remarkable contribution to the mitigation of volcanic hazards and volcanic risks. Volcano monitoring, eruption forecasting and the mitigation of volcanic hazards are key objectives of volcanologists and a duty of volcano observatories worldwide. Criteria for eligibility include: successful hazard assessment and mitigation efforts, and/or effective volcano surveillance and eruption forecasting and/or effective crisis management. This award will be presented every 2 years from 2018 at the Cities on Volcanoes Meeting (CoVs)” (IAVCEI website). The awards to date are listed below and at <https://www.iavceivolcano.org/guidelines-for-iavcei-awards/volcanic-surveillance-and-crisis-management-award/>.

2018 Center for Volcanology and Geologic Hazards Mitigation (CVGHM) (Pusat Vulkanologi an Mitigasi Bencana Geologi) Indonesia

2020 Instituto Geofísico de la Escuela Politécnica Nacional (IGEPN) Ecuador

Table 11 1990–2000 Decade Volcanoes and their locations (Source: Wikimedia Commons Decade Volcanoes: https://upload.wikimedia.org/wikipedia/commons/4/42/WikiReader_Decade_Volcanoes.pdf ; Wikipedia Decade Volcanoes: https://en.wikipedia.org/wiki/Decade_Volcanoes)

Volcano	Region	Country
Avachinsky-Koryaksky	Kamchatka	Russia
Colima	Jalisco	Mexico
Galeras	Nariño	Colombia
Mauna Loa	Hawaii	USA
Mount Etna	Sicily	Italy
Mount Merapi	Central Java	Indonesia
Mount Nyiragongo	North Kivu	Democratic Republic of the Congo
Mount Rainier	Washington	USA
Mount Vesuvius	Campania	Italy
Mount Unzen	Nagasaki/Kumamoto	Japan
Sakurajima	Kagoshima	Japan
Santa María	Quetzaltenango	Guatemala
Santorini	South Aegean	Greece
Taal Volcano	Calabarzon	Philippines
Teide	Canary Islands	Spain
Ulawun	East New Britain/ West New Britain	Papua New Guinea

Decade volcanoes

The United Nations declared 1990–2000 to be the International Decade for Natural Disaster Reduction, and as a result, IAVCEI identified 16 volcanoes worldwide to be the focus of studies for the IAVCEI Decade Volcanoes Program (Table 11). This summary is taken from a useful overview of the Decade Volcanoes program on Wikipedia and Wikimedia. The criteria for choosing these volcanoes included recent eruptive activity, multiple potential hazards, proximity to centres of population, high risk levels to the population in the event of eruptions, reasonable access for study, and support from local scientific and government organisations. IAVCEI had hoped that funding would be made available from the United Nations, but this did not eventuate. Most studies were funded by national research organisations and through international collaborative aid programs. Not surprisingly, some volcanoes received greater attention than others, depending on resources available.

A number of these volcanoes have been volcanically active since being declared Decade Volcanoes, including Avachinsky (1991, 2002; Smithsonian Institute Global Volcanism Program website), [Koryaksky](#) volcano (2009; SI GVP), Colima (many times), Galeras in 1993, when 6 scientists (during Decades Volcanoes workshop) and 2 tourists

were killed, Etna (many times), Merapi (many times), and Taal volcano in 2020 and 2021. Nyiragongo volcano in the Congo had erupted catastrophically in 1977, involving extremely fast flowing lava that killed 70 people. It experienced another eruption in 1994, during the civil war there, and then another large eruption in 2002, which again produced far flowing lavas that inundated Goma and killed ~150 people due to CO₂ asphyxiation and building collapses. Mt Unzen underwent a 4-year-long eruption from 1991 to 1995 (see above), and Sakurajima has been almost constantly active marked by frequent, spaced vulcanian explosions. Santa Maria volcano has also been almost constantly active from its summit dome complex, and both Santorini and Teide have experienced seismic crises, without an eruption occurring. Ulawun volcano is frequently active but is notable for its very high emissions of SO₂.

Major volcanic eruptions during IAVCEI's 100-year history and the lessons learned

Since IAVCEI was formed in 1919, there have been many major volcanic eruptions, but some have been more significant than others for varying reasons. The following is a list of some of these volcanic events and a brief statement as to why, in the author's subjective assessment, they were significant in developing our understanding of volcanic processes and in many cases by highlighting previously poorly understood concepts and phenomena. Not all of the volcanoes listed here have been Decade volcanoes listed in Table 11.

1919 explosive eruption of Kelud (Kelut) volcano, Indonesia

More than 5000 people were killed, during this eruption in the year that IAVCEI was formed, mostly by syn-eruptive mudflows, or lahars, resulting from ejection of much of the summit crater lake water during the VEI 4 explosive eruption. As a result of the 1919 eruption, the precursor of the Indonesian volcanological survey was established by the Dutch colonial government, and a tunnel was built to drain much of the summit crater lake. However, after another explosive eruption in 1951, the crater was deepened, and the crater lake water capacity increased, so another drainage tunnel was built at a lower elevation, to again drain much of the crater lake. Thouret et al. (1998) have provided a brief overview of the 1919 eruption and its circumstances, and Wikipedia provides a summary of the most significant

eruptions, including the most recent eruptions in 1990, 2007, and 2014.

1943–1952 eruption of Parícutin Volcano, Mexico

This surprisingly long, (VEI 3?) 9-year eruption of a monogenetic scoria cone volcano is famous because it erupted with little warning in a corn field and then through an extended eruption of scoria, ash, and lava, buried in a nearby town (Luhr et al. 1993; Pioli et al. 2008). It is perhaps the type of eruption and volcano from which the concept of “violent strombolian” eruptions was developed (Walker 1973; Pioli et al. 2008).

1944 explosive eruption of Vesuvius Volcano, Italy

Although best known for the 79 AD explosive eruption that buried the Roman towns of Pompeii and Herculaneum, the less well-known VEI 3 eruption in 1944 (Cubellis et al. 2016) had a significant impact on the final stages of World War II, indicating the potential socio-political impact of volcanic eruptions. The eruption occurred when Allied forces were planning the final stages of the advance on German forces in northern Italy. A strategic part of this exercise was to use aircraft based at an airport near the foot of Mt Vesuvius. Ash fall damaged and destroyed over 80 B25 bombers (fuselage, windscreen, engine, and gunnery damage), and it took months to repair and replace many of them.

1951 eruption of Mt. Lamington in Papua New Guinea

This VEI 4 eruption killed over 3,000 people, almost all of whom were killed by a Mt. St Helens like lateral blast flow from a cataclysmic explosion on 21 January 1951 (Taylor 1983). This eruption heralds our first awareness of sector collapses and lateral blasts from stratovolcanoes, although these phenomena were not fully appreciated until the 1980 eruption of Mt. St Helens. A small amphitheatre-like crater was also produced.

1955–1957 eruption of Bezymianny volcano in Kamchatka, Russia

The VEI 5 eruption of Bezymianny volcano began in 1955 with small precursor explosive eruptions and growth of a lava dome in the progressively enlarging crater, culminated in a violent explosive eruption on 30th March 1956 that produced a sector collapse debris avalanche and a

directed blast flow that flattened forests (Gorshkov 1959; Belousov et al. 2007), as had occurred at Mt. Lamington in 1951, and occurred again at Mt. St Helens in 1980. As in both these other cases, a lava dome then grew in the crater after the cataclysmic explosion. No one was killed.

1965 eruption of Taal volcano, Philippines

Taal volcano is best known for the VEI 4 phreatomagmatic explosive eruption of 28th to 30th September 1965, during which radially flowing clouds of gas and wet ash were documented (Moore et al. 1966), from which the concept of volcanic base surges was defined. This followed observations and introduction of the term “base surge” in 1950 during nuclear tests in the ocean (Moore 1967). Similar phenomena had been observed during the eruptions of Capelinhos volcano in the Azores in 1957 and during the Surtsey eruption in Iceland in 1963–1964. Little is known that Taal volcano is actually a large mafic caldera that formed through several large volume, prehistoric, mafic ignimbrite-forming eruptions. Taal volcanic island from which historic eruptions occurred, including 1965, has grown in the water-filled caldera. Taal again erupted in similar phreatomagmatic style but smaller scale in 2020 and 2021.

1980 eruption of Mt. St Helens, USA

The spectacular VEI 5 explosive eruption of Mt. St Helens in the Cascade volcanic arc, USA, on 18th May 1980 (Lipman and Mullineaux 1981) is one of the most iconic eruptions of modern times for two reasons. First, the spectacular sector collapse and debris avalanche event, triggered by a magnitude 5 earthquake, followed by the vertical and lateral blast and ensuing blast flow were captured on time lapse photography. Secondly, in a 6-h period, a stratigraphy of blast flow deposits, debris avalanche, debris flow, pyroclastic pumice flow, and fallout deposits, tens of m and more in thickness in places accumulated, followed by extrusion of a lava dome from the vent. The blast flow flattened the forests in a broad fan to the north of the volcano for a distance up to 35 km from the vent, aligning snapped-off tree trunks up to 1 m in diameter parallel to the flow direction. As with many other significant explosive eruptions, there were several small precursor explosive events. At least 57 people were killed.

1982 eruption of El Chichón volcano, Mexico

The eruption of El Chichón volcano on 29th March and 4th April 1982 (Sigurdsson et al. 1984) was largely unexpected but produced a VEI 5 magnitude explosive eruption that killed >1,900 people and generated 3 eruption columns >

20 km high. Although volcanologically well known for the spectacular surge dune fields produced by pyroclastic density currents up to 8 km from the volcano (Sigurdsson et al. 1987), it was also an important eruption because of the very high SO₂ and Cl₂ released into the stratosphere, leading to a 1.2°C increase in stratospheric temperature, and a resulting depletion in ozone levels in the northern hemisphere (Robock 2000), and a surface cooling in the northern hemisphere of up to 0.4°C for 2 years after the eruption.

1982 eruption of Galunggung volcano, Indonesia

The 1982 VEI 4 explosive eruption of Galunggung volcano (Gourgaud et al. 1989; Katili and Sudradjat 1984; Sudradjat and Tilling 1984) in Indonesia is most famous for the effects of ash ingested into the aircraft jet engines of a British Airways 747 airliner on 26th June 1982, causing failure of all four engines and causing the plane to “glide” (plummet?) more than 7,000 m before the pilots could generate enough thrust in denser air at lower altitude to restart the engines and land at Jakarta airport. One month later, a Singapore Airlines flight experienced a similar near disaster. Since those events, a greater awareness of the dangers of airborne ash to aircraft engines has led to many flight cancellations worldwide following major explosive eruptions. Significant research into the impact of airborne ash on jet engines and development of ash-detecting radar technology on weather satellites and on aircraft occurred after these eruption-induced aviation incidents, funded in large part by the aviation industry.

1985 eruption of Nevado del Ruiz volcano, Colombia (13 November 1985)

The VEI 3 explosive eruption of Nevado del Ruiz on 13th November 1985, for which there were prior indications of an imminent eruption, caused one of the highest death tolls of the twentieth century related to a volcanic eruption. The fatalities were not caused by the relatively small volume primary eruption phenomena but by the catastrophic debris flows or lahars generated when hot volcanic debris deposited on the summit melted snow and ice cover, which then generated huge debris flows that cascaded downslope and engulfed the city of Armero and others, causing >25,000 deaths (Naranjo et al. 1986). This event was again a reminder of the enormous hazards posed by secondary volcanic phenomena and especially volcano-ice interaction hazards in high altitude and low latitude settings (Huggel et al. 2007).

1983–2018 eruption of Kilauea Volcano, Hawai'i

Needless to say, the active island of Hawai'i (“the big island”) is an iconic volcanic system, consisting of at least 6 coalesced shield volcanoes. These have produced many

eruptions in historic times, mostly from Mauna Loa and Kilauea. The VEI 0 eruption that began along the south-east rift zone in 1983 (e.g. Poland et al. 2014; Garcia et al. 2021; Orr et al. 2013; Patrick et al. 2019a, 2019b), and was thought to have finished in 2018 after 35 years, has surprised everyone with its longevity, broken only by occasional breaks of days and weeks of hiatus. Although the phenomena witnessed and recorded in real time (lava lakes, fire fountains, a'a and pahoehoe lavas, lava tubes and flow inflation, breakouts, lava entries into the sea with associated quench fragmentation and phreatic explosions, formation of shoreline and off shore lava deltas, and presumably pillow lava propagation) have all been documented in the past, the evolution of visual media has produced an amazing visual record and library of all these phenomena for the research community and educators to use. Witnessing multiple eruptions often simultaneously active from widely separated vents at the summit caldera (Halema'uma'u crater) and from flank vents along the Eastern Rift Zone (Pu'u O'o, Kupaianaha, Estates) has also given insights into the diffuse magma plumbing system of basaltic shield volcanoes, the lateral propagation of subsurface dyke systems, and the connection between sub-summit magma reservoirs and lateral flank vent systems (Garcia et al. 2021). Geodetic and geophysical measurements created a clear understanding of the role of the flank eruptions in draining magma from under the summit magma reservoir, causing subsidence of the Kilauea caldera floor and at times recharge causing uprise of the floor (Neal et al. 2019). In 2008 the Halema'uma'u crater in the Kilauea summit caldera filled with magma, and it remained active until 2018. The magma was sourced directly from the underlying magma reservoir, but the height of the magma surface fluctuated in response to the discharge rates from the flank vents, indicating not only a physical connection, but a hydraulic pressure link (Patrick et al. 2019a, 2019b). The eruption appeared to have ended with the spectacular collapse of the Halema'uma'u crater walls in June 2018, but Halema'uma'u became active again from late December 2020 to late May 2021 and then active again in late September 2021. In addition, the active Hawai'i volcanic system has provided insights into aspects of the submarine part of its edifice, through investigations of the submarine eruption processes and deposits of its offshore wholly submarine vent system, Loihi seamount, which is located at water depths of 1,200 m and 35 km off the southern coast of Hawai'i (Clague et al. 2003; Schipper et al. 2010). An absolutely fascinating volcanic system!

1991 eruption of Pinatubo Volcano, Philippines

This VEI 5 eruption was significant for several reasons. It was one of the largest of modern times (>5 km³ DRE), producing >7 km³ of pyroclastic deposits (Newhall and

Punongbayan 1996). The management of this eruption by the PHIVOLCS (Philippines Volcanological Survey) was one of the most successfully known. Precursor events heralded a major imminent eruption. As a consequence, >65,000 people were evacuated to a radius of 15 km from the volcano, and ~250 people were killed by the actual eruption, which would have been significantly worse in the absence of the very effective crisis management by the PHIVOLCS. However, > 500 people were killed by hyper-concentrated flood flows in the following years, which rapidly resedimented the unconsolidated pyroclastic deposits, choking the watersheds around Pinatubo as river beds aggraded and transformed into braided rivers (Pierson et al. 1992; Gran et al. 2011). Another significant effect of the eruption was the release of ~20 Mt of SO₂ into the upper troposphere and stratosphere, leading to a 1.4°C warming of the stratosphere (Robock 2000) and a 0.5°C cooling at the Earth's surface in the 2 years after the eruption (Self et al. 1996).

1991–1995 eruption Mt. Unzen volcano, Japan

The prolonged, largely effusive, dacite lava dome complex forming eruption of Mt Unzen was important because, during this 4-year event, multiple, gravitational, dome-margin collapse events generated over 10,000 block and ash-flows and associated ash-cloud surge events (Nakada et al. 1999; Ui et al. 1999; Yamamoto et al. 1993). There were a very few explosive events during 4-year long lava dome forming eruption, with block and ash flows being generated by the gravitational spalling of hot blocks off the margins of lava lobes moving down the very steep upper slopes of the volcanic edifice (Nakada et al. 1999). The eruption was recorded in real time, allowing analysis and debate about lava dome and lobe growth and their rheological behaviour, combined with analysis of the rheological properties of the lava lobe dacite (Goto et al. 2020; Sato et al. 2021). After the eruption ceased, the conduit was drilled to ascertain its architecture, petrology, and rock textures (Nakada et al. 2005). The block and ash-flow deposits formed fans or aprons of deposits along the main pre-existing valleys (Nakada et al. 1999). During each monsoon season, as at Pinatubo, much of the block and ash-flow deposits were remobilized downstream by hot lahars, cold debris flows, hyper-concentrated flood flows, and stream flows. The primary and secondary deposits are interstratified in the fans; they are texturally and compositionally very similar to the primary block and ash-flow deposits and difficult to distinguish from them, which is an important lesson in the stratigraphic record (Uehara et al. 2015). Forty-three people were killed by the ash-cloud surge associated with a block and ash-flow event in June 1991 (Yamamoto et al. 1993), including volcanologists

Katia and Maurice Krafft and Harry Glicken. Tens of people were killed by flood events, and hundreds of homes were destroyed during the eruption. In 1792, a major dome sector collapse of Mt. Unzen generated a landslide that entered the sea and caused a tsunami that killed 15,000 people.

1995–2015 eruption of the Soufrière Hills Volcano, Montserrat

This eruption was important because of its longevity, multiple eruption phases, and the great variety of volcanic phenomena that occurred. Like the Unzen eruption, the Soufrière Hills eruption was largely a lava dome-forming eruption, but unlike Unzen, there were more explosive events (Druitt and Kokelaar 2002; Wadge et al. 2014). The spectrum of processes include effusive lava dome growth and gravitational and explosive collapse, vulcanian explosions, transitioning into plinian eruption styles, block and ash-flows, pumice and ash-flows, surges, a Mt St Helens style lateral blast on 26th December, 1997, debris avalanches, debris flows, hyper-concentrated flood flows and stream flows, and growth of composite pyroclastic-volcaniclastic sediment fans and deltas. At least 19 people were killed in an eruption in 1997; the capital Plymouth, the airport, and several smaller settlements were destroyed, and about 8,000 people were evacuated from the island, some of whom have returned. However, a significant outcome of this eruption has been advancement of research and educational concepts and understanding, with excellent imagery of processes.

1998, 2011, and 2015 eruptions of Axial Seamount Volcano, Juan de Fuca Ridge, Pacific Ocean

Most volcanologists have never heard of this volcano, because it is part of the East Pacific Spreading Ridge at a water depth of 1,200m. Its importance lies in the fact that a seafloor observatory stocked with a huge array of monitoring instruments was established in 1996 and is connected to the USA mainland by a 480-km-long seafloor cable that transmit signals in real time (Manalang and Delaney 2016). As a result, deep submarine eruptions have been recorded in real or near to real time. In one case, some instruments were engulfed in a seafloor lava flow. Together with expeditions using remote vehicles and submersibles, a great deal of information and improvements in understanding submarine volcanism have resulted, including the structure of the summit caldera, maps of the lava flow fields after each eruption, morphology of lava flows, geochronology, petrology, and geochemistry (e.g. Chadwick et al. 2016; Clague et al. 2013).

2010 eruption of Eyjafjallajökull in Iceland

The VEI 3 phreatomagmatic eruption of Eyjafjallajökull shield volcano in Iceland from 14 April to 22 May 2010 is famous for dispersing a plume of fine ash over most of Europe for a week from 14 to 20 April (Ripepe et al. 2013), causing most airports in northern Europe to close, leading to thousands of flight cancellations due to ash aviation hazards, and causing a commercial loss of billions of dollars. The effects of the very small scale eruption were enhanced by the meteorological and wind conditions that dispersed the ash cloud southeast over Europe (Ripepe et al. 2013). The eruption phase began on 20th March, with a flank fissure fire fountaining eruption that produced a lava flow field and lasted until 12th April. Magma then migrated within the edifice to the centre and began erupting subglacially on 14th April under the several hundred metre thick summit glacial ice sheet, causing it to melt upwards, creating a summit ice collapse pit and meltwater pond that fuelled ongoing phreatomagmatic explosive activity, the generation of easily transported fine ash that was dispersed downwind by a four to eight km high eruption column and downwind ash plume (Gudmudsson et al. 2012; Magnússon et al. 2012; Ripepe et al. 2013).

2012 eruption of Havre Volcano, Kermadec volcanic arc, north of New Zealand

Another important submarine eruption was the unwitnessed submarine eruption of the wholly submarine Havre stratovolcano in the Kermadec volcanic arc north of New Zealand in 2012. The first evidence of that eruption was a huge “raft” of floating pumice clasts in the ocean (Carey et al. 2018). The eruption was therefore first thought to have been explosive. An oceanic cruise deployed remote vehicles to map the seafloor topography at a scale of 2 to 5 m bathymetric contour spacing, capture high resolution images and collecting specimens from the sea floor in and around the summit caldera. The bathymetry was converted into high resolution digital elevation models and compared with pre-eruption bathymetry, showing that the eruption occurred from a ring fracture along the pre-existing caldera rim at a water depth of 900 m, producing an arcuate line of submarine rhyolitic lava domes with highly pumiceous carapaces (Carey et al. 2018), as well a field of dispersed “giant” pumice and a stratified sequence of finer pumice. The giant pumice formed by the quench fragmentation of the pumice carapace of the erupting magma forming buoyant blocks that detached from it and drifted until they became water-logged (Manga et al. 2018; Mitchell et al. 2019), which casts doubt on simplistic interpretations of the origin of pumice in deep water settings. One phase of the eruption has been interpreted to have

been explosive, producing dispersed pumice and ash deposits (Murch et al. 2019).

2014 eruption of Ontake volcano in Japan

The phreatic explosive eruption of Ontake stratovolcano on 27th October 2014 was unexpected, although post eruptive analysis of earthquake data indicated slightly elevated levels of volcano-tectonic seismic activity prior to the eruption that killed 63 people who were recreational or pilgrim hikers (Kaneko et al. 2016; Maeda et al. 2017). The explosive eruption was phreatic-hydrothermal, based on very minor juvenile magmatic components; most pyroclasts were hydrothermally altered andesite and dacite fragments from pre-existing source rocks (Maeno et al. 2016). The deposits include abundant ballistic ejecta, pyroclastic density current and ash fallout deposits with a very high fine ash fraction, and evidence of wet aggregation (Kaneko et al. 2016; Maeno et al. 2016). The hydrothermal explosion is thought to have been triggered by fracturing of the cap rock to a hydrothermal aquifer, leading to instantaneous explosive decompression and flashing of over-pressured hot water to steam. It is not clear if it was an earthquake or hydrothermal fluid overpressure that caused the cap rock to fracture. The event was a clear reminder that hydrothermal explosions can occur unexpectedly at any volcano with an active hydrothermal system. Ontake is known to have previously experienced such hydrothermal explosive eruptions in 1979, 1991, and 2007.

1974 and 2018 eruptions of Fuego volcano in Guatemala in 1974 and 2018

Fuego volcano in Guatemala has erupted many times, including the 1974 VEI 4 scale eruption. The 1974 eruption was spread over 10 days in October, marked by four major vulcanian explosive events that produced widespread fallout, pyroclastic flows that flowed up to seven km from the vent, and subsequent volcanic mudflows (Davies et al. 1978). Since then Fuego has been regularly active with numerous small eruptions. Given how active Fuego was during 2017, another major explosive event similar to 1974, as occurred on 5th June 2018 and subsequent days, should have been considered to be highly possible. With the experience of 1974, contingency plans to rapidly alert and evacuate should have been well in place. Sadly ~200 died as a result of the impacts of air-fallout deposits overloading roofs and causing collapse, hot pyroclastic flows, inhalation of ash, and volcanic mudflows, within a radius of 10 km of the volcano. Lessons were not learned from 1974, or they were forgotten, and effective education of the communities around the volcano about the likely hazards and possible magnitude of

an eruption, one of the most valuable tools in risk minimization, does not seem to have occurred.

Summary and possible future directions

IAVCEI has blossomed from small beginnings in 1919 when it first formed, at a time when international communication and travel was difficult. It has become the pre-eminent international learned association that promotes advances in understanding volcanic eruption and related processes and the hazards and risks they pose. IAVCEI has become an inclusive association and now has members from almost all countries, who participate in the democratic governance of the association. With its focus on facilitating and communicating research outcomes, largely through its major conferences (General Assemblies, Scientific Assemblies, Cities on Volcanoes) and the activities of its varied research commissions, IAVCEI has remained at the forefront of promoting volcanological research. Through its very active schedule of conferences and commission-based workshops, IAVCEI is one of the most active of the eight scientific associations in IUGG, to which it contributes in its governance and policy development, and through involvement in a number of the IUGG inter-association commissions.

IAVCEI has developed a culture of acknowledging research excellence through its series of awards for its members and in recent years has taken a significant initiative in encouraging and mentoring its ever changing population of early career researchers through the establishment of an Early Career Researchers Network and by adding an Early Career Researcher position to its committee or bureau. The masthead journal of IAVCEI, *Bulletin of Volcanology*, has evolved significantly over its nearly 100 years of history and continues to be a major destination for papers on volcanological research for the international volcanology community. So, the future for IAVCEI looks very healthy!

However, IAVCEI can be more proactive in some of the ways it serves its members. It needs to continue to improve diversity and inclusivity, especially in representative positions on its committees. Gender imbalance in membership of the IAVCEI Executive Committee and at all position levels remains notable, and nationality representation on the committee can also be widened. This involves pro-active encouragement for women and previously unrepresented nationalities to be nominated for positions prior to the IAVCEI democratic elections. In addition, IAVCEI can continue to improve affordability to participate in all its activities for all its members, such as attendance at conferences and workshops, especially for students, members from poor countries, and members with little financial support. IAVCEI already provides generous financial support for this cohort of members but attempts should be made to increase this. This can

be done by increasing financial member numbers, so increasing income that can be used for such purposes.

It is surprising that membership numbers of IAVCEI, as the pre-eminent international learned association in volcanology, are not higher. IAVCEI should therefore be more proactive in promoting the benefits of membership of IAVCEI internationally, and this could be achieved by establishing more formal or semi-formal links with volcanological communities in as many countries as possible, which begins with building a database of such communities. In addition, at the time of writing, the fees that IAVCEI's journal, *Bulletin of Volcanology*, charges for the option of open access publication of research papers are the highest of the four international volcanological journals, discouraging some members from publishing in BV, which thus impacts on likely citation numbers and the impact factor of BV. IAVCEI are currently investigating eliminating open access fees for *Bulletin of Volcanology*, making it a diamond class open access journal, or at least making the fee minimal, thus providing a service for IAVCEI members.

Although making available funding for research is currently beyond the scope of IAVCEI because it is not a research organisation or institution and lacks funding, it could be more proactive in initiating global research programs that could indirectly generate research support for scientists in their own countries. As an example, Jon Stix (pers. comm.) has suggested initiating another Decade Volcanoes program, which could again be promoted by the United Nations as a major scientific program that would greatly benefit society.

Appendix

IAVCEI executive committee or bureau membership 1919–2023 (sources: *Bulletin Volcanologique*, IUGG Yearbooks, Cas 2019)

2019–2023

<i>President:</i>	Patrick Allard	France
<i>Vice-Presidents:</i>	Masato Iguchi	Japan
	Jan Lindsay	New Zealand
<i>Secretary-General:</i>	Roberto Sulpizio	Italy
<i>Members:</i>	Fidel Costa	Singapore
	Eisuke Fujita	Japan
	Lizzette Rodriguez	Puerto Rico
	José Viramonte	Argentina
<i>Early Career rep.</i>	Julia Eychenne	France
<i>Past President:</i>	Donald Dingwell	Germany
<i>Editor, Bulletin of Volcanology:</i>	Andrew Harris	France
	Frances van Wyk de Vries	France
<i>Webmaster and Membership Secretary:</i>	Eugenio Nicotra	Italy

2015–2019

President: Donald Dingwell Germany
Vice-Presidents: Patrick Allard France
 Shanaka de Silva USA
Secretary-General: Roberto Sulpizio Italy
Members: Eliza Calder Scotland
 Jan Lindsay New Zealand
 Michael Ort USA
 Lizzette Rodríguez Puerto Rico
Past President: Ray Cas Australia
Editor, Bulletin of Volcanology: Andrew Harris France
 Frances van Wyk de Vries France
Webmaster and Membership Secretary: Eugenio Nicotra Italy

2011–2015

President: Ray Cas Australia
Vice-Presidents: Stephen Self USA
 Hugo Delgado Mexico
Secretary-General: Joan Martí Spain
Members: Patty Mothes Ecuador
 Karoly Nemeth New Zealand
 Hiroshi Shinohara Japan
 Greg Valentine USA
Past President: Setsuya Nakada Japan
Editor, Bulletin of Volcanology: James White New Zealand
 Linda White New Zealand
Webmaster and Membership Secretary: Adelina Geyer Spain

2007–2011

President: Setsuya Nakada Japan
Vice-Presidents: Anita Grunder USA
 Hugo Moreno-Roa Chile
Secretary-General: Joan Martí Spain
Members: Marta Calvache Colombia
 Piero Dellino Italy
 Juan Manuel Espindola Mexico
 James White New Zealand
Past President: Oded Navon Israel
Editor, Bulletin of Volcanology: John Stix (2007–2010) Canada
 J.R. Clark (2007–2010) Canada
 James White (2011) New Zealand
 Linda White (2011) New Zealand
Webmaster and Membership Secretary: Adelina Geyer Spain

2003–2007

President: Oded Navon Israel
Vice-Presidents: Toshitsugu Fujii Japan
 Jocelyn McPhie Australia
Secretary-General: Steve McNutt USA

Deputy Secretary-General: John Dehn USA
Members: Anita Grunder USA
 Jean-Christophe Komorowski France
 Hugo Moreno-Roa Chile
 Renato Solidum Philippines
Past President: Steve Sparks UK
Editor, Bulletin of Volcanology: John Stix Canada
Webmaster and Membership Secretary: Caroline Giddings Australia

1999–2003

President: Steve Sparks UK
Vice-Presidents: Joerg Keller Germany
 Tadahide Ui Japan
Secretary-General: Steve McNutt USA
Deputy Secretary General: John Dehn USA
Members: Toshitsugu Fujii Japan
 Bruce Houghton New Zealand
 Jocelyn McPhie Australia
 Hugo Moreno Chile
 Raden Sukyhar Indonesia
Past President: Grant Heiken USA
Editors, Bulletin of Volcanology: Tim Druitt France
 Jean-Francois Lenat France
Membership Secretary: Caroline Giddings Australia

1995–1999

President: Grant Heiken USA
Vice-Presidents: Andy Duncan South Africa
 Franco Barberi Italy
Secretary-General: R. Wally Johnson Australia
Assistant Secretary-General: Ray Cas Australia
Members: Marta Mantovani Brazil
 Hiroyuki Hamaguchi Japan
Past President: Paolo Gasparini Italy
Editor, Bulletin of Volcanology: Don Swanson USA
 Chris Newhall USA
Membership Secretary: Caroline Giddings Australia

1991–1995

President: Paolo Gasparini Italy
Vice-Presidents: J.L. Cheminee France
 Robert Tilling USA
Secretary-General: R. Wally Johnson Australia
Deputy Secretary-General: Bruce Houghton New Zealand
Members: Servando De La Cruz-Reyna Mexico
 B. Ivanov Russia
 H. Okada Japan
 Ray Punongbayan Philippines
Past President: Shigeo Aramaki Japan
Editor, Bulletin of Volcanology: Hans-Ulrich Schmincke Germany

1987–1991

President: Shigeo Aramaki Japan
Vice-Presidents: Paolo Gasparini Italy
 Peter Lipman USA
Secretary-General: Hans-Ulrich Schmincke Germany
Members: Jim Cole New Zealand
 Servando De La Cruz-Reyna Mexico
 M.P. Semet France
 V.M. Sugrobov USSR
Past President: Ian Gass UK
Editors, Bulletin of Volcanology:
 Hans-Ulrich Schmincke (1987–1991) Germany
 Steve Sparks (1987–1989) UK
 Gail Mahood (1990–1991) USA

1983–1987

President: Ian Gass UK
Vice-Presidents: D. Shimozuru Japan
 L.C. Villari Italy
Secretary-General: Hans-Ulrich Schmincke Germany
Members: Jim Cole New Zealand
 Peter Lipman USA
 M.P. Semet France
 A. Sudrajat Indonesia
Past President: Sergei Fedotov USSR
Editors, Bulletin Volcanologique: Franco Barberi (1983–1984) Italy
 F. Esu Cugusi (1983–1984) Italy
 Hans-Ulrich Schmincke (1986–1987) Germany
 Steve Sparks (1986–1987) UK

1979–1983

President: Sergei Fedotov USSR
Vice-Presidents: Ian McDougall Australia
 I. Yokoyama Japan
Secretary-General: P.E. Baker UK
Members: Robert Decker USA
 Dallas Peck USA
 G.E. Sigvaldason Iceland
 A. Sudrajat Indonesia
 L.C. Villari Italy
Past President: Robert Decker USA
Editors, Bulletin Volcanologique: Franco Barberi Italy
 F. Esu Cugusi Italy

1975–1979

President: Robert Decker USA
Vice-Presidents: Sergei Fedotov USSR
 Ian McDougall Australia

Secretary-General: P.E. Baker UK
Deputy Secretary-General: M. Girod France
Members: F.R. Boyd USA
 D. Radelescu Romania
 J. Varet France
 I Yokoyama Japan
Past President: Georgii Gorshkov USSR
Editor, Bulletin Volcanologique: Franco Barberi Italy
 F. Esu Cugusi Italy

1971–1975

President: Georgii Gorshkov USSR
Vice-Presidents: Takeshi Minakami Japan
Secretary-General: Pierre Evrard Belgium
Deputy Secretary-General: M. Girod France
Members: ? ???
Past President: Gordon A. MacDonald USA
Editor, Bulletin Volcanologique: F. Esu Cugusi Italy
 M. Mittempergher Italy

1967–1971

President: Gordon A. MacDonald USA
Vice-Presidents: Georgii Gorshkov USSR
 E.A. Vincent UK
Secretary-General: Pierre Evrard Belgium
Members: P. Bordet France
 E. Ingerson USA
 J. Healy New Zealand
 T Minakami
Past President: Hishashi Kuno Japan
Editor, Bulletin Volcanologique: F. Esu Cugusi Italy
 M. Mittempergher Italy

1963–1967

President: Hisashi Kuno Japan
Vice-Presidents: ???
Secretary-General: Francesco Penta Italy
Members: ???
Past President: Alfred Rittmann Switzerland/Italy
Editor, Bulletin Volcanologique: Francesco Penta Italy
 (1959–1966)
 F. Esu Cugusi – G. Marinelli (1967)

1954–1963

President: Alfred Rittmann Switzerland/Italy
Vice-Presidents: ???
Secretary-General: Francesco Signore (1954–1959) Italy
 Francesco Penta (1960–1963) Italy
Members: ???
Editor, Bulletin Volcanologique: Francesco Signore Italy
 (1954–1959)
 Francesco Penta (1960–1963) Italy

1948–1954

President: Berend G. Escher Netherlands
Vice-Presidents: L. Glangeaud France
 A.G. MacGregor Great Britain
 N. Nielsen Denmark
 H. Williams USA
Secretary-General: Francesco Signore Italy
Editor, Bulletin Volcanologique: Francesco Signore Italy

1936–1948

President: Auguste Michel-Lévy France
Vice-Presidents: Berend G. Escher Netherlands
 T. Jaggar USA
 J.E. Richey Great Britain
Secretary-General: Francesco Signore Italy
Editor, Bulletin Volcanologique: Francesco Signore Italy

1933–1936

President: Konstantinos A. Ktenas Greece
Vice-Presidents: Auguste Michel-Lévy France
 Hidezo Tanakadate Japan
Secretary-General: Alessandro Malladra Italy
Editor, Bulletin Volcanologique: Alessandro Malladra Italy

1927–1933

President: Alessandro Malladra Italy
Vice-Presidents: ???
Secretary-General: Alessandro Malladra Italy
Editor, Bulletin Volcanologique: Alessandro Malladra Italy

1922–1927

President: Alfred Lacroix France
Vice-Presidents: Henry S. Washington USA
 L.F. Navarro Spain
Secretary-General: Alessandro Malladra Italy
Assistant S.G.: G. Plantania Italy
Editor, Bulletin Volcanologique: Alessandro Malladra Italy

1919–1922

President: Annibale Ricco (2 months) Italy
 Alfred LaCroix (de facto) France
Vice-Presidents: Alfred Lacroix France
 Henry S. Washington Great Britain
Secretary-General: Alessandro Malladra Italy
Editor, Bulletin Volcanologique: Alessandro Malladra Italy

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including sources that are not specifically cited but provided details on some topics relevant to understanding the evolution of IAVCEI, and may be useful sources of historical information for other researchers

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