



IUGG UNION COMMISSIONS

Terms of Reference

This document presents the Terms of References of the following IUGG Union Commissions:

- Union Commission on Climatic and Environmental Change (2019-2023)
- Union Commission on Mathematical Geophysics (2019-2023)
- Union Commission on Geophysical Risk and Sustainability (2019-2023)
- Union Commission on the Study of the Earth's Deep Interior (2019-2023)
- Union Commission on Planetary Sciences (2019-2023)

TERMS OF REFERENCE 2019-2023

IUGG UNION COMMISSION ON CLIMATIC AND ENVIRONMENTAL CHANGE

Preamble

Our Climate is changing all the time due to a number of various causes, internal as well as external, natural as well as anthropogenic. Observational and theoretical evidence suggest that the ice ages, which are the largest systematic changes of the Earth's climate, result from the changing latitudinal and seasonal distribution of solar irradiation related to the cycling of the Earth's orbital parameters. A much better understanding of the natural variations of climate is fundamental for a credible assessment of the human contribution to climate change, now and in the future. The Commission on Climatic and Environmental Change (CCEC) is an international forum to advance the science of climate and global change and make available the scientific knowledge and methods that assist in promoting environmental and public welfare in the face of climate variability and change. The climatic and environmental changes considered by the commission include (but are not limited to) the response of the atmosphere, oceans, glaciers, sea level, water resources, ocean acidification, Earth rotation, gravity, and shape, biogeochemistry to climate warming.

Advancing scientific understanding of climatic and environmental change is necessarily interdisciplinary, building on fundamental understanding of the functioning of the atmosphere (IAMAS), the oceans (IAPSO), the hydrologic cycle (IAHS), the cryosphere (IACS), solar interactions (IAGA), solid Earth changes (IAG, e.g., the Global Geodetic Observing System, GGOS), as well as the land surface processes and external manifestations, such as volcanoes, of interior processes of the Earth (IAVCEI, IASPEI). Links with other fields not represented in the IUGG such as forestry, agricultural sciences and health sciences are also necessary to gain a proper understanding of climate change effects.

Purpose

The CCEC operates as a Union Commission within IUGG. The CCEC was established by the Executive Committee of the IUGG in 2012 in order to promote the advancement of scientific understanding of climatic and environmental change, to boost research in reducing uncertainties in climate and environmental models, to define criteria for collaborative trans-disciplinary research on climate and environmental change, to fulfill the objectives of the IUGG and its associations, to provide an all-Union perspective on climatic and environmental change, and to make available the knowledge and insights developed through scientific research to the benefit of society and planet Earth, including consideration of the science of global change, related vulnerability and impacts, and potential responses.

The CCEC provides a focus for the IUGG scientific expertise in climate and environment related areas across the breadth of all IUGG disciplines and associations. The CCEC enables the breadth of the IUGG expertise to be brought to bear at the global level through collaborating with, and underpinning the work of the ICSU and other international organizations. It also enables the geographic dissemination of the IUGG expertise to be brought to bear at the local level through involvement with national bodies in the organization of meetings and other activities.

Objectives

- To build a scientific capacity for responsibly addressing the broad, multi-disciplinary issues involved in climatic and environmental change;

- To provide reliable information, interpretation of research results, and support to the public and governmental organizations;
- To interact and cooperate with outside activities that would benefit from the capabilities and resources of the IUGG Associations; and
- To strengthen links across the Scientific Associations within the IUGG, to build new external links to organizations outside the IUGG, to strengthen existing links to external organizations and to promote IUGG's contribution to global change research.

Executive Committee

The Executive Committee consists of Commission Officers, a Representatives' Committee and co-opted members and the immediate Past Chair. The officers are a Chair, Vice Chair and Secretary-Treasurer. The Representatives' Committee consists of two representatives from each participating IUGG Association. The Representatives' Committee may co-opt up to four persons (irrespective of IUGG Association) to become members of the Executive Committee. The Representatives' Committee elects the officers – namely the Chair, Vice Chair, and Secretary-Treasurer, who do not necessarily need to be one of the designated representatives from an IUGG Association. Representation on the Executive Committee, irrespective of leadership roles, is for a 4 year term, renewable once.

Cognate groupings such as SCOR, SCAR, the Union Commission on Geophysical Risk and Sustainability, or the WMO Commission on Climate, may send observers to meetings of the executive committee.

Procedure

- In advance of an IUGG General Assembly (every 4 years), each IUGG Association will be asked to nominate experts to sit on the CCEC Executive Committee, in cases where a position is vacant.
- Prior to or during an IUGG General Assembly, the Representatives' Committee shall select officers of the Commission: a Chair, a Vice-Chair, and a Secretary/Treasurer.
- The IUGG Vice-President shall be informed about the results of the election prior to, or during, the IUGG General Assembly. The list of CCEC officers is subject to approval by the IUGG Bureau and their term of office shall start immediately after the IUGG General Assembly.
- Any motions put to the CCEC must be passed by a two-thirds majority of the Executive Committee.

Membership

- Membership of the CCEC is optional to all scientists who commit to the CCEC purpose and objectives.
- Membership of the CCEC does not lapse. However, members may be removed by the Executive Committee if they are inactive for a period of at least 4 years.
- The CCEC Secretary shall keep an up-to-date register of members.

Meetings

- The CCEC shall meet during IUGG General Assemblies and at scientific events the commission organizes.

Reporting

- The CCEC shall submit activity and financial reports to the IUGG Secretary General annually and a quadrennial report 5 months before the IUGG General Assembly.

Funding

- The CCEC shall have access to funds allocated by the IUGG.
- The CCEC Secretary/Treasurer shall collect funds, make payments and keep correct accounts and books showing the financial affairs of the CCEC.
- The IUGG contributes up to US \$5000 dollars annually to defray the costs of running the Commission; The small core budget is necessary as seed funding to ensure initial activities of the Commission and thus provide a basis for Commission members to seek additional resources on an activity-specific, or project, basis.

Continuation

- The CCEC shall normally be reviewed by the Executive Committee of the IUGG every 4 years.
- The CCEC will terminate its activities through a decision of the IUGG Executive Committee.

TERMS OF REFERENCE 2019-2023
IUGG UNION COMMISSION ON MATHEMATICAL GEOPHYSICS

- The IUGG Union Commission on Mathematical Geophysics (acronym, CMG) was established by decision of the IUGG Executive Committee in 1971.
- The purpose and scope of CMG is to encourage exchange of ideas and information in all areas of geophysics, with emphasis on the application of mathematical theory to geophysical problems, and to promote the development and application of mathematical methods and appropriate theoretical techniques for the solution of problems across the complete spectrum of geophysical disciplines.
- Membership of CMG Executive Committee includes nominated representatives of IUGG and its Associations. Each Association may nominate up to 2 members.
- The CMG Executive Committee consists of Chair, two Vice Chairs (representing different geographical locations and research expertise), Secretary, Past Chair, and Members at large.
- Term of office of the CMG Executive Committee members is 4 years (the period between IUGG General Assemblies), but may be extended for one additional consecutive period. The Chair and Vice Chairs shall serve in their capacities for one period and their term of office may be extended for not more than one additional consecutive periods. Secretary shall serve for one period and her/his term of office may be extended for not more than two additional consecutive periods. Replacement of members shall be in a staggered manner in order to ensure efficient and continuous functioning of the Commission.
- Prior an IUGG General Assembly CMG selects from among its members Chair, two Vice Chairs, and Secretary. CMG informs the IUGG President-Elect and Secretary General on the results of the selection. The list of CMG officers is subject to approval by the IUGG Bureau and their term of office shall start immediately after the IUGG General Assembly.
- The CMG meets during IUGG General Assemblies and at scientific events it organizes.
- The CMG can appoint an Advisory Board comprising of experts in the field of mathematical geophysics, past members of the Commission who have had dedicated and exemplary service to the Commission, and representatives from relevant international, regional and national organizations. The Board shall advise and provide guidance on (i) strategy in development of research on mathematical geophysics, and (ii) cooperation between IUGG and other organizations on problems related to mathematical geophysics.
- CMG submits annual activity and financial reports to the IUGG Secretary General and Treasurer, respectively.
- CMG has access to IUGG fund allocation.
- CMG is reviewed by the IUGG Executive Committee every 4 years.
- CMG terminates its activities by the decision of the IUGG Executive Committee.

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IUGG UNION COMMISSION ON GEOPHYSICAL RISK AND SUSTAINABILITY

- The IUGG Union Commission on Geophysical Risk and Sustainability (Georisk Commission; GRC) was established by decision of the IUGG Executive Committee in August 2000.

Purpose and Scope

- The purpose of the GRC is to promote scientific studies aimed at reducing risks from natural hazards in an increasingly urbanized world. The GRC shall facilitate communication between scientists through meetings, workshops, publications, websites etc., between scientists and decision makers, and between scientists and the general public.
- The scope of the GRC shall include research and knowledge dissemination on all types of geophysical hazards and their mitigation measures. The hazards shall include but are not limited to floods and droughts, landslides and debris flow, earthquakes and tsunami, volcanic eruptions, fires, windstorms, magnetic storms and other natural or human induced environmental hazards. The GRC shall also promote and foster research activities on scientific aspects of geophysical hazards and risk minimization as well their societal impacts.

Executive Committee

- Nine months prior to the General Assembly (every 4 years), each IUGG Association will be asked to nominate one expert to sit on the GRC Executive Committee, in cases where a position is vacant.
- Prior to an IUGG General Assembly, the GRC shall elect a Chair, two Vice-Chairs (on the basis of geographical location and research expertise), a Secretary and a Treasurer.
- The Chair, two Vice-chairs, Secretary, Treasurer, the 8 representatives of associations and the immediate Past-Chair form the 14-member GRC Executive Committee.
- The IUGG Vice-President shall be informed about the results of the election prior to the IUGG General Assembly. The list of GRC Executive Officers is subject to approval by the IUGG Bureau and their term of office shall start immediately after the IUGG General Assembly.
- The Term of Office of a GRC Executive Officer shall be 4 years, but may be extended for a further period of not more than 4 years.

Membership

- Membership of the GRC is option to all scientists who share the mission of the GRC to promote research on natural hazards, disaster risk and sustainability to the benefit of society.
- Membership of the GRC does not lapse. However, members may be removed by the Executive Committee if they are inactive for a period of at least 4 years.
- The GRC Secretary shall keep an up-to-date register of members.

Advisory Board

- The GRC may appoint an Advisory Board of no more than five members comprising of experts in the field of natural hazards and risks, and representatives from relevant international, regional and national organizations.
- The Board shall advise on (i) strategy in development of research on natural hazards and risk, and (ii) cooperation between IUGG and other organizations on problems related to natural hazards, risks and sustainability. The Board shall provide guidance and constructive criticism to help charter the future direction of the GRC's activities.
- The term of office of an Advisory Board Member shall be 4 years initially but may be extended for a further period of not more than 4 years.

Honorary Members

- The GRC may from time to time appoint Honorary Members, comprising past or existing members of the Commission who have had dedicated and exemplary service to the Commission.
- The term of office of an Honorary Member is permanent.

Meetings

- The GRC shall meet during IUGG General Assemblies and at scientific events it organizes.

Voting

- Any motions put to the GRC, including nominations for Advisory Board and Honorary Members, must be passed by a two-thirds majority of the Executive Committee.

Reporting

- The GRC shall submit activity and financial reports to the IUGG Secretary General as required.

Funding

- The GRC shall have access to funds allocated by the IUGG.
- The GRC Treasurer shall collect funds, make payments and keep correct accounts and books showing the financial affairs of the GRC.

Continuation

- The GRC shall be reviewed by the Executive Committee of IUGG every 4 years.
- The GRC will terminate its activities through a decision of the IUGG Executive Committee.

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IUGG UNION COMMISSION ON THE STUDY OF EARTH'S DEEP INTERIOR

Preamble

SEDI is an international scientific organization dedicated to the **Study of the Earth's Deep Interior**. The ultimate goal of SEDI is an enhanced understanding of the past evolution and current thermal, dynamical and chemical state of the Earth's deep interior and of the effect that the interior has on the structures and processes observed at the surface of the Earth. The 'deep interior' is generally considered to be the core and lower mantle, but interest may extend to the surface, for example, in the study of mantle plumes or dynamics of descending lithospheric slabs.

The scientific questions and problems of interest to SEDI include the evolution of the Earth's deep interior, composition, structure and dynamics. Topics include: the Earth's mantle, its structure, evolution as well as its mineralogy and the properties of its deep reservoirs; the core-mantle boundary region and coupling between core and mantle; the fluid outer core, where the Earth's magnetic field is generated by dynamo action, and understanding the core dynamics, chemistry and evolution, tied to changes in the magnetic field through time; and finally the inner core, its structure, mineralogy and evolution.

Purpose

Since 1987, SEDI has been a Union Committee of the International Union of Geodesy and Geophysics (IUGG). As such, it cuts across the traditional discipline-oriented bounds of the Associations of the IUGG [such as the International Association of Geodesy (IAG), the International Association of Geomagnetism and Aeronomy (IAGA), the International Association of Seismology and Physics of the Earth's Interior (IASPEI), and the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)] which normally study the Earth from a particular point of view. The intent of SEDI is to amalgamate together the knowledge from different scientific disciplines to generate the most coherent and up-to-date picture of the structures, dynamics and evolution of the Earth's deep interior.

Objectives

SEDI serves the interests of the scientific community in three ways:

- by serving as an information conduit for scientific activities related to the deep interior of the Earth,
- by organizing scientific symposia and sessions at IUGG and other meetings,
- by providing an organizational framework for scientific projects.

Executive committee

SEDI is headed by a Chair, a Vice Chair and a Secretary General and guided by an Executive Committee.

The officers are chosen at open business meetings held at the quadrennial IUGG General Assemblies. The terms of these three offices is for four years.

In advance of an IUGG General Assembly (every 4 years), SEDI officers will be asked to nominate experts to sit on the SEDI Executive Committee, in cases where a position is vacant.

Membership

Membership is informal; it is sufficient to send an email message to the secretary, containing a name and an address, with an expression of interest to become a member of SEDI. The secretary of SEDI maintains an email list for the purpose of scientific exchange only.

Meetings

SEDI organises a scientific meeting every two years. The meeting places are decided online through non-binding voting and announced through the mailing list and on the SEDI website.

Members of SEDI can also organise sessions during IUGG General Assembly, IASPEI and IAGA, and other SEDI-related meetings.

Reporting

SEDI submits activity and financial reports to the IUGG Secretary General and Treasurer annually.

Funding

SEDI receives funding from IUGG to support beginning scientists to attend the biennial SEDI meetings.

The SEDI Secretary/Treasurer also writes biennial proposals to US NSF to support US-based beginning researchers to attend the SEDI meetings.

The Doornbos fund exists to award 2-3 small prizes at the biennial SEDI meetings to beginning investigators who have made an outstanding contribution to our understanding of the deep Earth.

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IUGG UNION COMMISSION ON PLANETARY SCIENCES

Preamble

In the last half-century, planetary science has become a significant interdisciplinary field of research with the advances in space exploration and ground-based studies. The field now ventures far beyond the solar system to include planets around other stars and is attracting interdisciplinary scientists from around the world. Detailed characterization of planetary environments beyond our planet requires collaborative studies across many research fields of Earth and space sciences.

Several Associations of IUGG deal with planetary issues, but mostly independently. Namely, IAMAS has a commission devoted to planetary atmospheres – the International Commission on Planetary Atmospheres and Evolution (ICPAE). IAG had an Inter-Commission Committee on Planetary Geodesy and a Joint Project on Geodetic Planetology. IACS has a division on Planetary and other Ices of the Solar System. IASPEI and IAVCEI have been working on planetary interior structure and evolution, planetary seismology and volcanology. IAGA welcomes scientists to join in research of magnetism and aeronomy of other bodies of the solar system. With lakes and oceans being explored on outer planet moons such as Titan, Europa, Enceladus, and missions such as MESSENGER and BepiColombo, Lunar Reconnaissance Orbiter investigating the interior structure of rocky bodies like Mercury and the Moon, there is a need for a comprehensive home for planetary sciences within IUGG.

Purpose

The IUGG Union Commission on Planetary Sciences (UCPS) was established by decision of the IUGG Executive Committee in June 2015, which promotes the advancement of scientific understanding of planetary science and exploration of the solar system origin, formation and evolution including a search for life beyond Earth. The UCPS is jointly sponsored by IACS, IAG, IAGA, IAHS, IAMAS, IAPSO, IASPEI, and IAVCEI. The UCPS together with the IUGG associations will share the knowledge and insights on planetary formation and origin through scientific research and comparative studies between planetary objects and the Earth in the fields of atmosphere, surface and interiors research.

Objectives

- to promote the study of all scientific problems on planetary science and to encourage planetary research;
- to promote and coordinate international cooperation in planetary science, and promote planetary science activities in developing countries;
- to provide, on an international basis, for discussion and publication of the results of the studies, research and work indicated above;
- to contribute to coordinating activity for possible future space missions.

Executive Committee

- In advance of an IUGG General Assembly (every 4 years), each IUGG Association will be asked to nominate experts to sit on the UCPS Executive Committee, in cases where a position is vacant.
- Prior to an IUGG General Assembly, the UCPS shall select officers of the Commission: a Chair, two Vice-Chairs (on the basis of geographical location and/or research expertise), and a Secretary/Treasurer from the Executive Committee membership.
- The Chair, two Vice-chairs, Secretary/Treasurer, members-at-large representing Union Associations, and the immediate Past-Chair form the UCPS Executive Committee. The number of members-at-large is determined so, that to get all Union Associations involved in the work of the Commission's Executive Committee. Normally the UCPS Executive Committee should have one representative from one Association.
- The IUGG Vice-President shall be informed about the results of the election prior to the

IUGG General Assembly. The list of UCPS officers is subject to approval by the IUGG Bureau and their term of office shall start immediately after the IUGG General Assembly.

- The Term of Office of a UCPS officer shall be 4 years, but may be extended for a further period of not more than 4 years.
- Any motions put to the UCPS must be passed by a two-thirds majority of the Executive Committee.

Membership

- Membership of the UCPS is option to all scientists who share the UCPS purpose and objectives.
- Membership of the UCPS does not lapse. However, members may be removed by the Executive Committee if they are inactive for a period of at least 4 years.
- The UCPS Secretary shall keep an up-to-date register of members.

Meetings

- The UCPS shall meet during IUGG General Assemblies and at scientific events the commission organizes.

Reporting

- The UCPS shall submit activity and financial reports to the IUGG Secretary General annually and a quadrennial report 5 months before IUGG General Assembly.

Funding

- The UCPS shall have access to funds allocated by the IUGG.
- The UCPS Secretary/Treasurer shall collect funds, make payments and keep correct accounts and books showing the financial affairs of the UCPS.

Continuation

- The UCPS shall normally be reviewed by the Executive Committee of IUGG every 4 years.
- The UCPS will terminate its activities through a decision of the IUGG Executive Committee.