



Union Geodesique et Geophysique Internationale
International Union of Geodesy and Geophysics



Centennial | 1919-2019 | *Centenaire*



International
Science Council

International Cooperation in Earth and Space Sciences

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Immediate Past Secretary General, International Union of Geodesy and Geophysics (IUGG)

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Image: Bauer, 1919

The International Research Council (IRC), founded in July 1919, comprised 16 national academies and research councils from around the world. Around the same time, international unions were created for astronomy, biology, chemistry, **geodesy and geophysics**, mathematics, physics and radio sciences.

IUGG was founded on **28 July 1919** with 6 Sections in Geodesy (IAG), Terrestrial Magnetism and Electricity (IAGA), Meteorology (IAMAS), Physical Oceanography (IAPSO), Seismology (IASPEI), and Volcanology (IAVCEI). Section of Scientific Hydrology (IAHS) was added in 1922, and the IUGG association in cryospheric sciences (IACS) was founded in 2007.

ICSU + ISSC = International Science Council (ISC)





International Science Council

[since 2018; a merger of the International Council for Science (ICSU)
and the International Social Science Council (ISSC)]

Member Organizations 142
(e.g. academies, research councils)

**International Unions
and Associations 40**

**Major Inter-disciplinary
Programs 17** (e.g. Future
Earth, WCRP, IRDR, UHWP)

**Affiliated
Members 30**
(e.g. TWAS)

Formal Relations with the United Nations as Coordinator of the UN Major Group for Science & Technology

**ISC vision is of science
as a global public good**

**ISC mission is to be the
global voice for science**

ISC strategic objectives

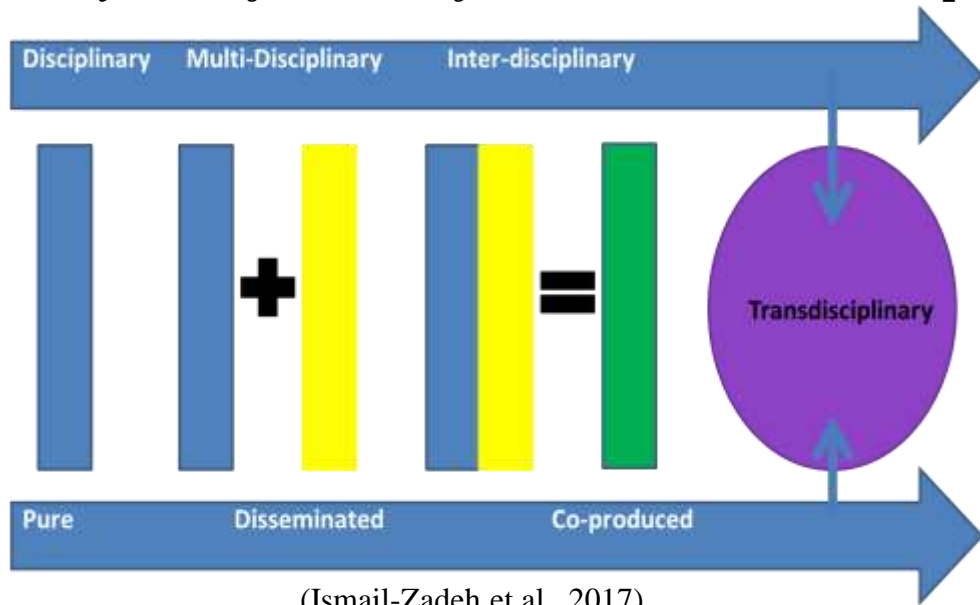
- Promote international research and scholarship on key global challenges
- Increase evidence-informed understanding and decision making at all levels of public policy, discourse and action
- Support the continued and equal advancement of scientific rigour, creativity and relevance in all parts of the world
- Protect scientific freedom and advocate principles for the responsible practice of science



International Science Council

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A catalyst and facilitator for inter- and trans-disciplinary activities across national boundaries



(Ismail-Zadeh et al., 2017)

Focus on production of **actionable knowledge** through international initiatives



So oft in theologic wars, the disputants, I ween,
rail on an utter ignorance of what each other mean,
and prate about an elephant not one of them has seen!



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Four domains of challenge and opportunity

- *Integrated science for global sustainability: Complexity and policy coherence*
- *SDG Interactions as a policy driver*

- *Science-policy interfaces and advisory ecosystems at the global level*
- *The public value of science*
- *Science and the private sector*

The 2030
Agenda for
Sustainable
Development

The Digital
Revolution

Science in
Policy and
Public Action

The
Evolution of
Science and
Science
Systems

- *Data-driven interdisciplinarity*
- *Global data governance*

- *Women in science*
- *Refugee scientists*
- *Open Science*
- *The future of scientific publishing*
- *Knowledge production and governance as a global good*



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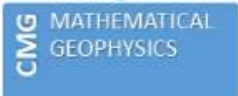


International Union of Geodesy and Geophysics (IUGG) 

Associations



Union Commissions and Working Group

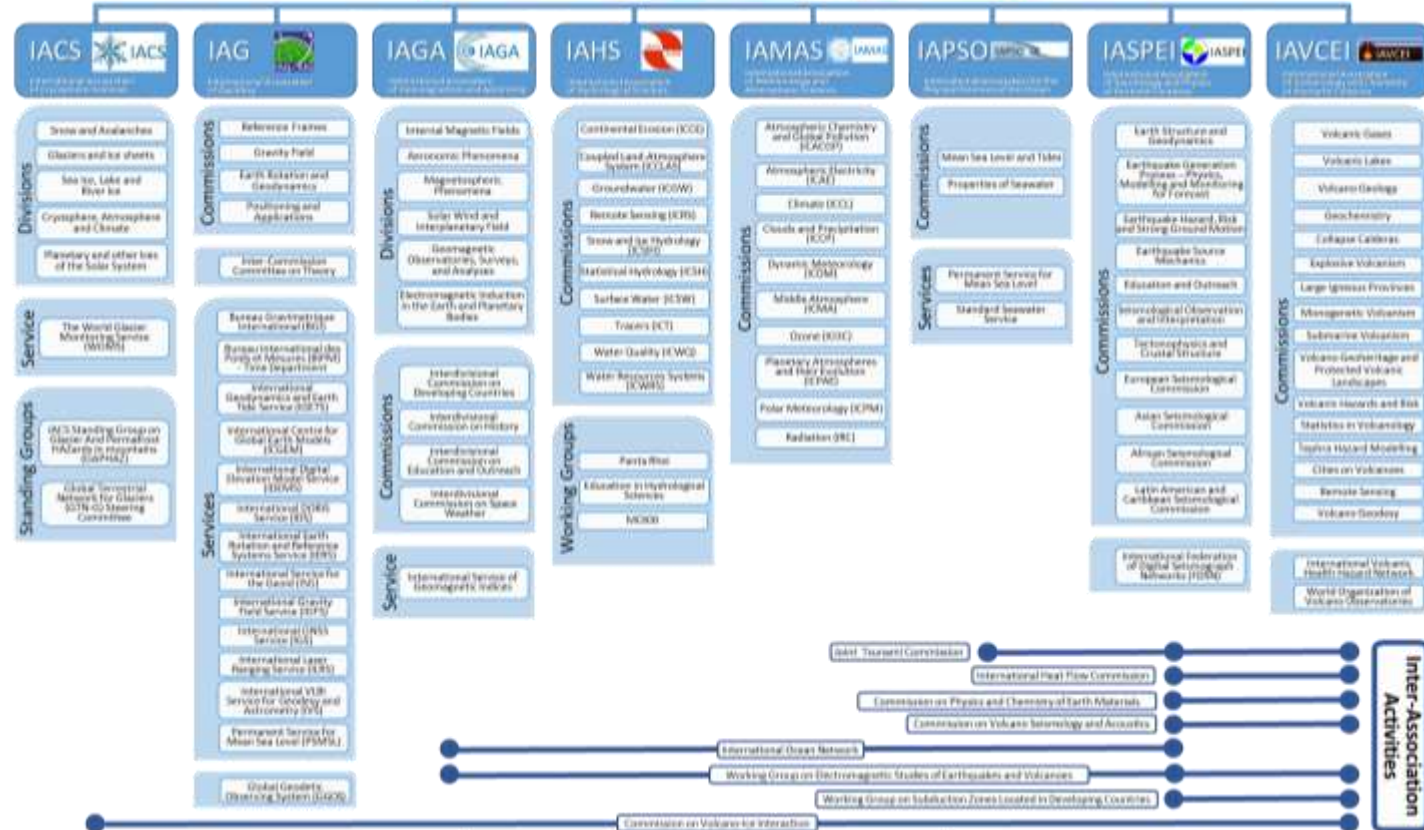




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National Membership

Affiliate membership

American Geosciences Institute 

Commission for the Geological Map of the World 

International Association for Geoethics 

International Association for Mathematical Geosciences 

International Consortium on Landslides 

Young Earth Scientists Network 

59 Regular Members

ALGERIA		DENMARK		JORDAN		SLOVAK REPUBLIC	
ARGENTINA		EGYPT		KOREA, Rep. of		SLOVENIA	
AUSTRALIA		ESTONIA		LUXEMBOURG		SOUTH AFRICA	
AUSTRIA		FINLAND		MEXICO		SPAIN	
AZERBAIJAN		FRANCE		MOZAMBIQUE		SWEDEN	
BELGIUM		GERMANY		NETHERLANDS		SWITZERLAND	
BRAZIL		GREECE		NEW ZEALAND		THAILAND	
BULGARIA		HUNGARY		NICARAGUA		TURKEY	
CANADA		ICELAND		NIGERIA		UK	
CHILE		INDIA		NORWAY		USA	
CHINA CAST		INDONESIA		PAKISTAN		VIETNAM	
CHINA Acad. Sinica		IRAN		POLAND			
COLOMBIA		IRELAND		PORTUGAL			
COSTA RICA		ISRAEL		ROMANIA			
CROATIA		ITALY		RUSSIA			
CZECH REPUBLIC		JAPAN		SAUDI ARABIA			

13 Associate Members

ALBANIA		BOSNIA & HERZEGOVINA		GHANA		MOROCCO	
ARMENIA		CONGO, D.R.		MAURITIUS		PERU	
BOLIVIA		GEORGIA		MACEDONIA, F.Y.R.O.		SERBIA	
						URUGUAY	



To adhere to IUGG, the National Academy of Sciences created in early 1919 an American Section for IUGG. Today this small Section becomes a world prominent scientific union of individual members:

American Geophysical Union (AGU)

with its famous Fall meetings, Chapman conferences, excellent publications and honor & recognition programs. Although AGU is not an international organization, but its more than 35% of members comes from more than 150 countries.



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**Bringing Nations Together
&
Enhancing
International Scientific Cooperation**



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The 3rd General Assembly in Prague, 1927



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The 7th General Assembly in Washington, D.C., 1939



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Delegates with Pope Pius XII

The 10th General Assembly in Rome, 1954



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The 15th General Assembly in Moscow, 1971



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The 23th General Assembly in Sapporo, 2003



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The 27th IUGG General Assembly in Montreal, 8-18 July 2019



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The IUGG Centennial Celebration at UNESCO 29 July 2019, Paris, France



Association Scientific Assemblies in 2017





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IUGG Conferences and Symposia



CMG 2018

SEDI 2016

UCPS 2018



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Promoting Fundamental Science





Lithosphere Dynamics & Plate Tectonics



John Tuzo Wilson (Canada)
IUGG President (1957-1960)

- *Upper Mantle Project* (UMP, 1964-1970): IUGG initiated and contributed to the project together with IUGS and other ICSU bodies.
- *International Geodynamics Project* (1972-1979) was a continuation of the UMP.
- This successful program spawned the *Inter-Union Commission on the Lithosphere* approved by ICSU in 1980 to implement the international program “Dynamics and Evolution of the Lithosphere: The Framework for Earth Resources and the Reduction of Hazards”. IUGS and IUGG carried out the scientific work of the project.

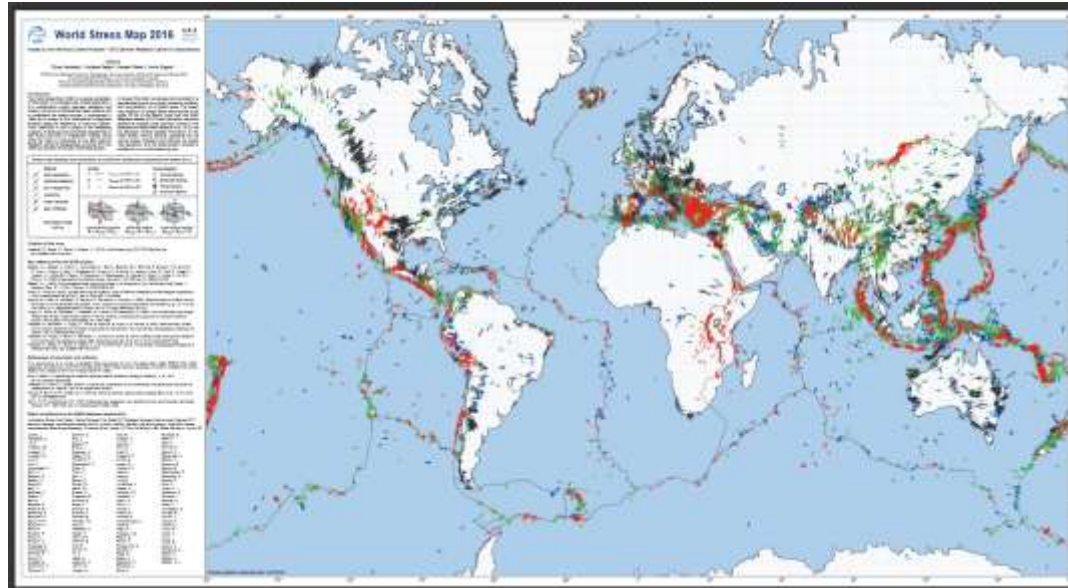


Vladimir V. Belousov (USSR)
IUGG President (1960-1963)



THE INTER-UNIONS COMMISSION: International Lithosphere Program (ILP)

ILP promotes multidisciplinary research projects of interest to both the geological and geophysical communities,
ILP seeks to achieve a fine balance between: “addressing societal needs” and “satisfying scientific curiosity”.





Climatic and Environmental Change



Bert Bolin (Sweden)
IUGG Bureau Member
(1963-1967)

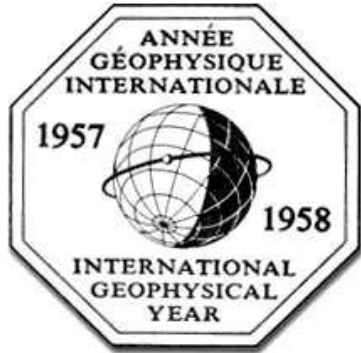
In 1979, Bert Bolin, a Swedish meteorologist and IUGG Bureau Member (1963-1967), led a group of scientists to set up the World Climate Research Programme (WCRP) to determine whether the climate was changing, whether climate could be predicted, and whether humans were in some way responsible for the change.

The program, established in 1980, was co-sponsored by ICSU and WMO. Since 1993, it is also co-sponsored by the Intergovernmental Oceanographic Commission (IOC) of UNESCO. WCRP core research projects (Global Energy and Water Exchange (GEWEX), the Climate and Ocean Variability, Predictability and Change (CLIVAR); the Stratosphere-troposphere Processes and their Role in Climate (SPARC), and Climate and Cryosphere (CliC)) are of particular interest to IUGG Associations and the Union Commission on Climatic and Environmental Changes (CCEC).



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The International Geophysical Year (IGY) lasted from 1 July 1957 to 31 December 1958 *has a special place in the history of international scientific cooperation of the 20th century.*

*“The spectacularly successful International Geophysical Year, run by the **International Union of Geodesy and Geophysics**, had received acclaim from the scientific world at large” (Harrison, 1978).*



Sydney Chapman (UK)
IUGG President, 1951-1954

The IGY was a remarkable project not only because of its outstanding accomplishments and the involvements of thousands of scientists, who contributed to the IGY success, but also because the year gave a rise to several major international initiatives (Ismail-Zadeh, 2016).



The images of the stamps are from the Internet



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To commemorate the IGY, IUGG initiated and/or participated in the International Years (2007-08)



Electronic Geophysical Year (eGY)



International Heliophysical Year (IHY)



International Year of Planet Earth (IYPE)



International Polar Year (IPY)



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Science Education Program



Workshop “Climate across the curriculum: Educational resources for teachers”,
Thimphu, Bhutan, 2019

Photos: Raju Sarkar



Science Education Program



MoU was signed between the IUGG and Abdus Salam International Centre for Theoretical Physics (ICTP) in 2011, and it was extended in 2015 and 2019.



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Science Education Program

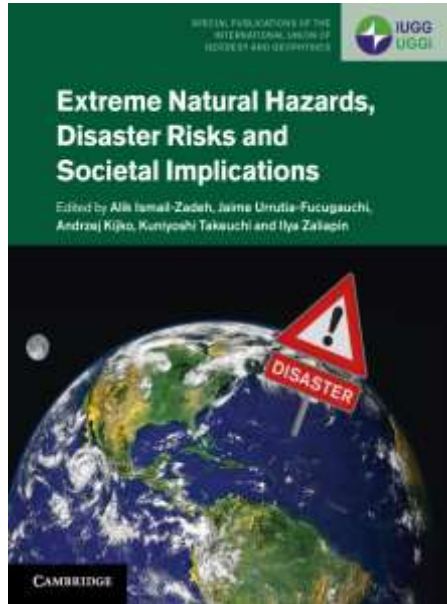


ICTP, Trieste, Italy

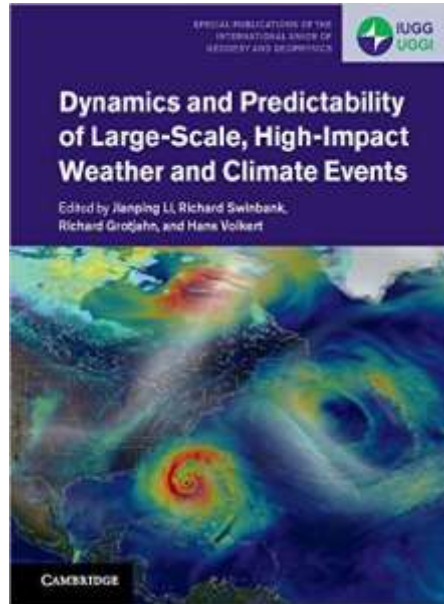
Photos: ICTP



Special Publications of the IUGG



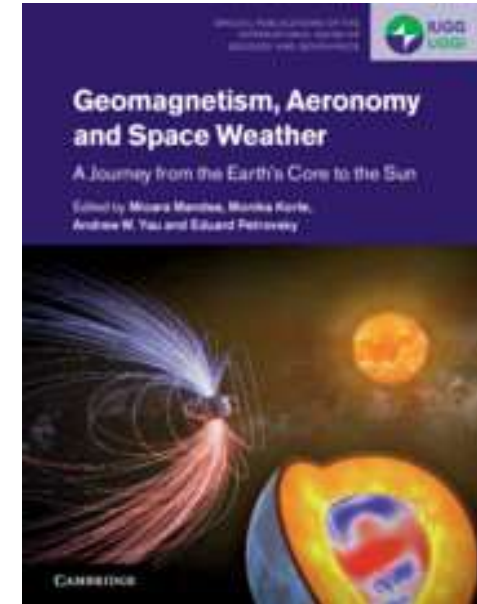
2014



2016



2018



2019



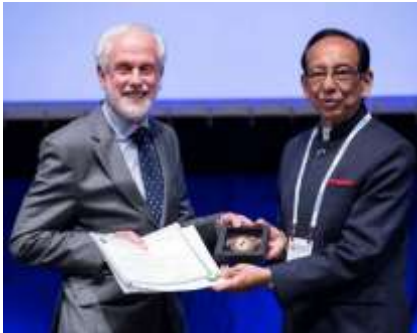
Association Publication Programs





Honor and Recognition Program

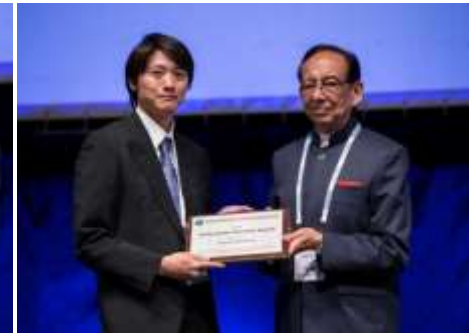
Gold Medal



Fellows



Early Career Scientist Award





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International Cooperation and Partnership



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UN

United Nations



UNESCO International
Hydrological Programme
(IHP)



UNESCO Intergovernmental
Oceanographic Commission
(IOC)



UNESCO Section on Earth Sciences
Geo-Hazards Risk Reduction



World Meteorological
Organization (WMO)



United Nations Committee of
Experts on Global Geospatial
Information Management
(UN-GGIM)



International Civil Aviation
Organization (ICAO)



Intergovernmental Panel on
Climate Change (IPCC)



ISC (former ICSU)

International Science Council



Committee on Data for Science
and Technology (CODATA)



Committee on Space Research
(COSPAR)



Scientific Committee
on Antarctic Research (SCAR)



Scientific Committee
on Oceanic Research (SCOR)



Scientific Committee
on Solar-Terrestrial Physics



World Data System



ICSU-ISSC-UNISDR Scientific
Committee on Integrated
Research on Disaster Risk



World Climate Research
Programme



Others

Consultative Committee
for Time and Frequency



Pan American Institute
of Geography and History



Group on Earth Observations



Preparatory Commission
for the Comprehensive
Nuclear-Test-Ban Treaty
Organization (CTBT)



American Geophysical
Union



Asia Oceania
Geosciences Society



European Geosciences
Union





A. Beliaikin on Unsplash

International Science Cooperation & Science Diplomacy



www.parliament.uk

“As we mark the centenary of international research cooperation, humanity faces its biggest challenge ever – *living sustainably on the planet*. It has never been more important for our society to understand and value science”

(Reddy and Ismail-Zadeh, *Nature*, 2019)



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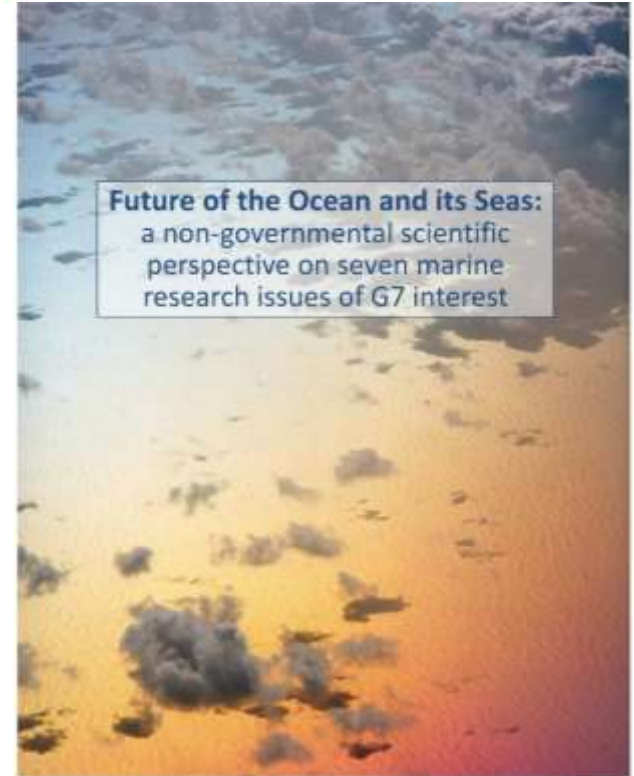


IAPSO/IUGG together with the Scientific Committee on Oceanic Research (SCOR/ ICSU) set up an ad-hoc working group with the intention to develop a report related to the topics highlighted in the G7 Science Ministers Communiqué in 2015.

The report was submitted to the Bureau of Science, Technology and Innovation, Cabinet Office of the Government of Japan. The Report was also sent to the Science Council of Japan, Federal Ministry for Education and Research (Germany), the Royal Society (UK), and the National Academy of Sciences(USA).



Photos: Science Council of Japan





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**The United Nations General
Assembly established a
permanent sub-committee
on geodesy to provide stability
and longer-term planning for the
Global Geodetic Reference Frame**

(photo: Anne Jørgensen)



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International Union of Geodesy and Geophysics (IUGG): Official Statement at the GP2017



UN World Conference on
Disaster Risk Reduction
2015 Sendai Japan



DISASTER RISKS RESEARCH AND ASSESSMENT
TO PROMOTE RISK REDUCTION AND MANAGEMENT



Editors: A. Ismail-Zadeh and S. Cutter



At the GP2019



(photos: UNDRR & AIZ)



Summary: Added value of the IUGG

◆ *Scientific and Outreach Programmes*

(*ILP*; *IGY*, *IYPE*, *eGY*, *IHY*, *IYGU*) improving awareness of scientific knowledge among nations, politicians and society

◆ *Science for Society*

(climate, natural hazards and disasters, mineral resources and water, soil and food security, biodiversity, etc.) Working together with nations and intergovernmental bodies

◆ *Science for the Developing World*

IUGG plays a special role in bridging state-of-the-art science to less-affluent countries of the world



Summary: Added value of the IUGG

- ◆ *Capacity Building and Science Education*
- ◆ *Data and Information* : observational and data services
- ◆ *Scientific products*
- ◆ IUGG plays an important *Regulatory Role in Geoscience*,
particularly in establishing the terms and conditions for international research cooperation,
setting scientific standards and nomenclatures, preparing universal tools, among other
aspects.



Thank you very much

Muchas gracias