The International Committee on Global Navigation Satellite Systems

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ICG: International Committee on GNSS

- Established in 2005, ICG represents a unique combination of GNSS service providers and major user groups that seek to encourage **interoperability and compatibility** among the various satellite systems
- ICG is an **important vehicle** in the multi-lateral arena, as satellite-based positioning, navigation and timing becomes more and more a **genuine multinational cooperative venture**

- **UNOOSA** serves as the **Executive Secretariat** of ICG and its Providers' Forum

- Membership: 13 Members and 21 International Organizations
- *Open to all countries and entities that are either GNSS providers or*

ICG: Providers' Forum

- Established in 2007, provides ways and means of promoting communication among system providers on key technical issues and operational concepts such as the GNSS ***spectrum protection, orbital debris, and orbit de-confliction***

- Agreement that all GNSS signals and services must be ***compatible*** and open signals and services should be ***interoperable*** to the maximum extent possible in order to maximize benefit to all GNSS users

- Consensus reached on ***Principle of Transparency*** - every GNSS provider should publish documentation that describes the signal and system information, the policies of provision and the minimum levels of

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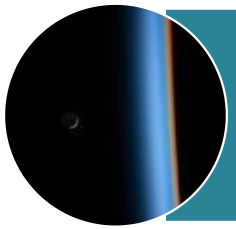
UNOOSA: Supporting Member States



Capacity Builder: UNOOSA provides access to cutting edge space-data and information and builds capacity to use such data to accelerate sustainable development

Convener: UNOOSA facilitates international cooperation among UN Member States to develop new space policy

Gateway: UNOOSA - the sole UN agency dedicated to space affairs - coordinates UN activities using space-related technology to support sustainable development

International Committee on GNSS: Working Groups

- ICG Working Groups:
  - **Systems, Signals and Services** *(USA and RF):* Compatibility and spectrum protection; interoperability and service standards; system-of-system operations
  - **Enhancement of GNSS Performance, New Services and Capabilities** *(India, China and ESA):* Future & novel integrity solutions; implementation of interoperable GNSS SSV and its evolution; examination of performance of atmospheric models
  - **Information Dissemination and Capacity Building** *(UNOOSA):* Focused on education and training programmes, promoting GNSS for scientific exploration
  - **Reference Frames, Timing and Applicati** *(IAG, ICS and FIG):* Focused on monitoring and reference station

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ICG WG S: Recommendation

- **Incorporating Resilience into GNSS Interference Detection and Mitigation**
  - To increase critical infrastructure resilience to GNSS disruptions and interference and consider the reinforcement of IDM policy based on a three-prong approach:

    - (*Service Aspect*): National GNSS spectrum protection and enforcement and implementation of IDM capabilities;

    - (*Hardware Aspect*): PNT systems designed with resilient system architectures and systems incorporating cybersecurity principles for a holistic approach to threats;

    - (*End-User Aspect*): End Users plan for and know how to respond

ICG WG B: Recommendation

- **Inclusion and Coordination of Lunar Search and Rescue in Lunar PNT Architecture**
  - Ensuring that search and rescue as a service is included in discussions of interoperability, compatibility and availability will be essential to ensure search and rescue services are maintained consistently among providers intending to offer such services.
  - Considering the successful collaboration between GNSS providers in providing interoperability within the MEOSAR system, and the importance of search and rescue around and on the surface of the moon
    - Developers of lunar communication and navigation services consider the integration of interoperable and easily accessible

ICG WG D: Recommendation

- Creation of a WG-D Task Force, "**Applications of GNSS for Disaster Risk Reduction**"
- To establish new collaborations – between international organizations, space agencies, member countries, and GNSS/RNSS providers – on the topic of using GNSS for disaster risk reduction and natural hazard early warning systems
- The scope of activities for this TF includes
  - fostering international recommendations and policies,
  - developing solid science connections to the strategic plans of relevant space agencies and GNSS/RNSS providers, and
  - facilitate collaboration on the development of operational tools.

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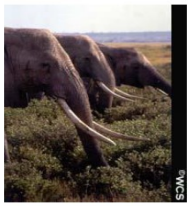
ICG WG C: Information Dissemination and Capacity Building


Wildlife Conservation

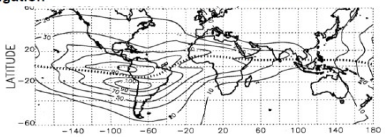

Land Navigation


Precision Farming


Air Navigation


Water Navigation


Disaster Relief



Scientific Exploration

Regional Workshops/training courses on the use and applications of GNSS:

- to reinforce the exchange of information between countries and scale up the capacities in the regions for pursuing the application of GNSS solutions
- to provide updated knowledge of how GNSS operate and their applications; to describe the science of SW; and how to perform ionospheric and SW research with GNSS data
- to provide information on the importance of planning and its link to the “why, what and how” of developing long-term capability with respect to GNSS and geospatial infrastructure and related activities

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ICG WG C: Information Dissemination and Capacity Building

- to prepare a ***handbook on high-accuracy GNSS data processing,*** summarizing data processing techniques, error analysis and various concepts relating to the set-up of base stations, rover units and software

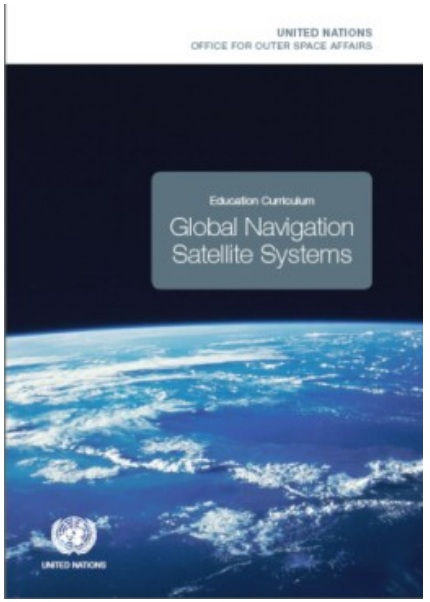
- A project team on "*Space weather monitoring using low-cost GNSS receiver systems*" that would develop prototype systems to explore the possibilities of using low-cost receiver systems for space weather monitoring

- **International meeting on GNSS , Vienna, 5 – 9 December 2022**
  - ICG's role in GNSS spectrum protection and interference detection and mitigation
  - Provide updated knowledge of how GNSS operate and their applications

https://www.unoosa.org/oosa/en/ourwork/psa/schedule/2022/un-international-meeting-gnss.html

Information Centres for ICG

The Programme of Space Applications established regional centres (**also acting as the ICG information centres**) in each region covered by the United Nations Economic Commissions: Africa, Asia and the Pacific, Latin America and the Caribbean, and Western Asia



THANK YOU

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