United Nations Programme on Global Navigation Satellite Systems Applications

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United Nations International Meeting on the Applications of Global Navigation Satellite Systems

Vienna International Centres

Vienna, Austria

Office for Outer Space Affairs
United Nations Office at Vienna

UNISPACE III

ICG International Committee on Global Navigation Satellite Systems

Programme on GNSS Applications:

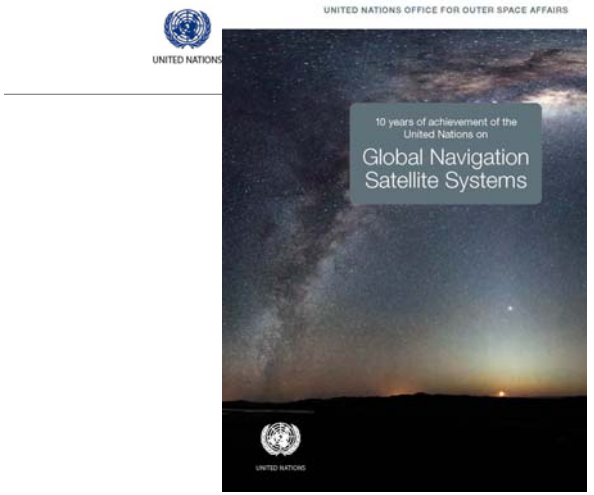
Background

- ***2001: Action on GNSS (Italy and USA) – implementation of the recommendations of UNISPACE-III, 1999***

Review of existing and planned GNSS and augmentations, their applications by system provider and user communities, including activities carried out by various entities to promote GNSS;

Examine the requirements of developing countries and gaps in meeting those requirements

- ***2001 – 2004: Series of Regional Workshops and International Meetings focusing on capacity-building in the use of GNSS in various areas of applications that support sustainable development***
- ***2005: International Committee on GNSS (ICG)***
- ***2011: International Meeting on GNSS, 12 – 16 December, Vienna, Austria***



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Information Dissemination and Capacity-Building:

Regional Workshops

- *2006 – 2011:* ***Zambia (ECA); China (ESCAP), Colombia (ECLAC), Azerbaijan, Moldova (ECE); UAE (ESCWA)***
  - ***Featured a wide variety of applications of GNSS***
  - ***Emphasized gaps in some applications that needed to be bridged between the potential end users and the GNSS capabilities***
  - ***Initiated pilot projects, and strengthened the networking of GNSS related institutions in the regions***
- ***2011: UN International Meeting on GNSS, 12 – 16 December 2011, Vienna, Austria***
- ***To build upon the results of each workshop contributing to defining a plan of action and the definition of functional partnerships in the long- term while also strengthening existing strategies at the regional level***
- ***To build upon a number of on-going initiatives such as the International Space Weather Initiative (ISWI), multi-GNSS demonstration project, the realization of the regional reference frames and systems, the activities of the UN-affiliated Regional Centres for space science and technology education also acting as the ICG Information Centres***
- ***To discuss proposals to be forwarded to the ICG to be held in 2012***

UN/Latvia Workshop on GNSS, 14 – 18 May 2012, Riga

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Information Dissemination and Capacity Building:

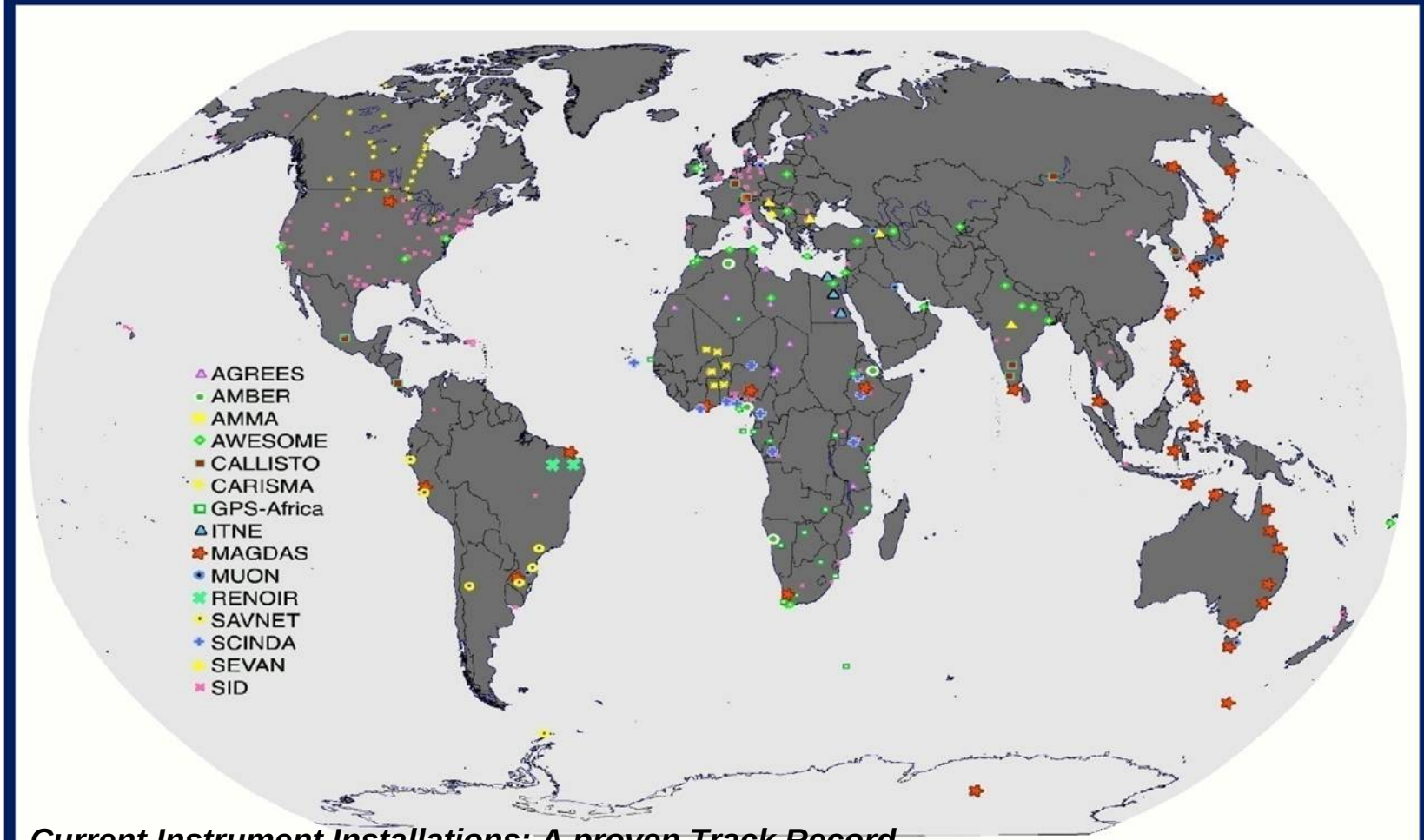
International Space Weather Initiative (ISWI)

A programme of international cooperation to advance the space weather science by a combination of instrument deployment, analysis and interpretation of space weather data from the deployed instruments in conjunction with space data, and communicate the results to the public and students

A follow-up activity to the International Heliophysical Year 2007 (IHY2007), but focusing exclusively on space weather

Status and results of the instrument arrays, data recording and data analysis are being reported annually to UNCOPUOS that mandated the organization of three workshops:

- ***2010: UN/Egypt Workshop, 6 – 10 November, Helwan University: Western Asia***
- ***2011: UN/Nigeria Workshop, 17 – 21 October, Abuja: Africa***
- ***2012: UN/Ecuador Workshop: Latin America and the Caribbean***



Current Instrument Installations: A proven Track Record

This model for developing instrument networks was proven during IHY2007

Information Dissemination and Capacity Building:

International Space Weather Initiative (ISWI)

About 1000 instruments located in 97 countries, utilized in 14 operating instrument arrays:

- ***GPS receivers***
- ***Very low frequency receivers***
- ***Magnetometers***
- ***Solar spectrometers***
- ***Particle detectors***

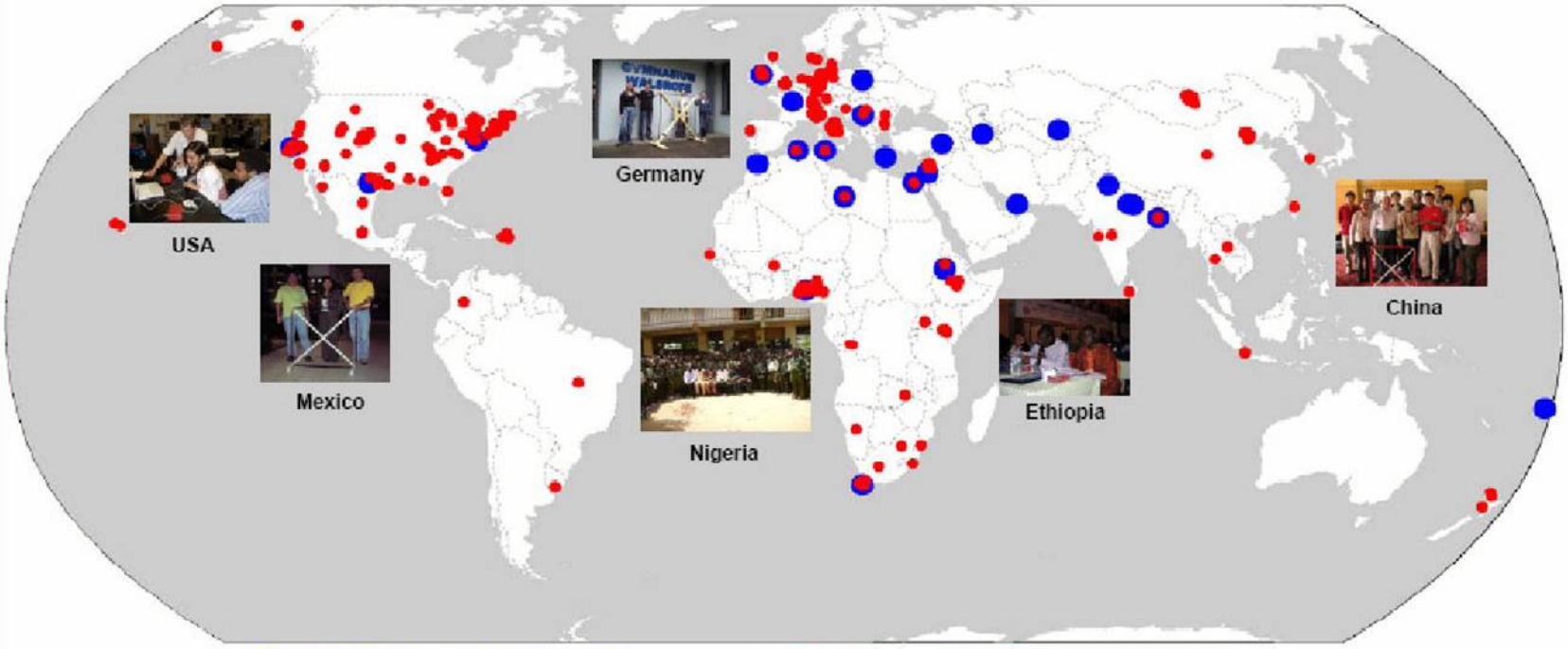
The largest ISWI instrument array consists of 380 very low frequency receivers for monitoring sudden ionospheric disturbances (SID)

- ***2010: SuperSID has been installed at the UNOV and records solar activity impact on the ionosphere since then***
- ***Data automatically transferred to the Stanford University Solar Centre for further data processing and making the data available on the web:***

http://solar-centre.stanford.edu/SID

Space Weather Monitor Sites

IHY Distribution 2007-2009

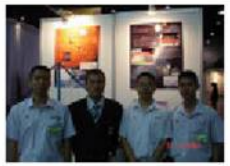


USA

Romania

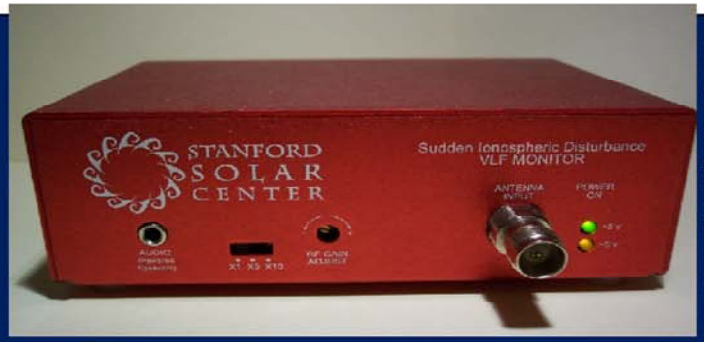
Lebanon

Thailand

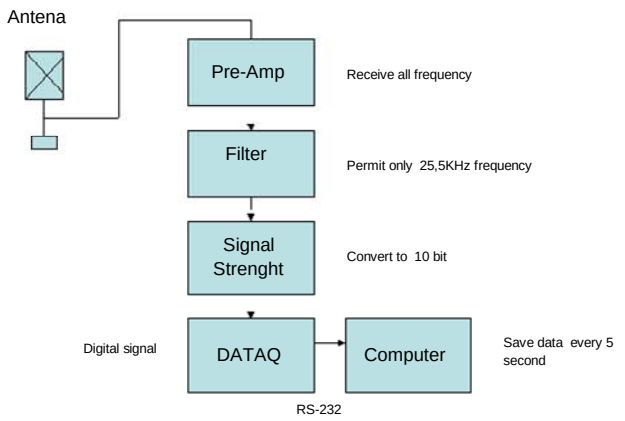


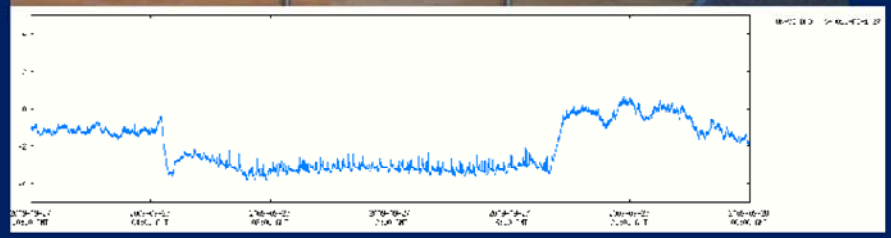
Instrument Programme

- Sudden Ionospheric Disturbance Monitor (SID) operated by UNOOSA



Principle of SID monitor





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Information Dissemination and Capacity Building:

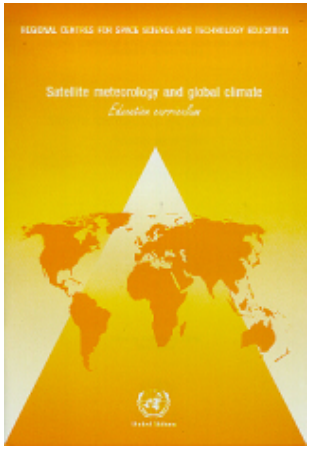
Training for capacity building in developing countries

Provide support to the regional centres for space science and technology education, affiliated to the United Nations, which would also act as the ICG Information Centres

- ***Morocco and Nigeria for Africa, Brazil and Mexico for Latin America and the Caribbean, and India for Asia and the Pacific***

The goal of the Centres is to develop, through in-depth education, an indigenous capability for research and applications in the core disciplines developed through UN expert meetings with support of prominent educators in 1989, 1995 and 2001 for each topic:

- **Remote Sensing and Geographical Information Systems**
- **Satellite Communications**
- **Satellite Meteorology and Global Climate**
- **Space and Atmospheric Sciences as well as data management**
  - *Development of the GNSS Education Curriculum*



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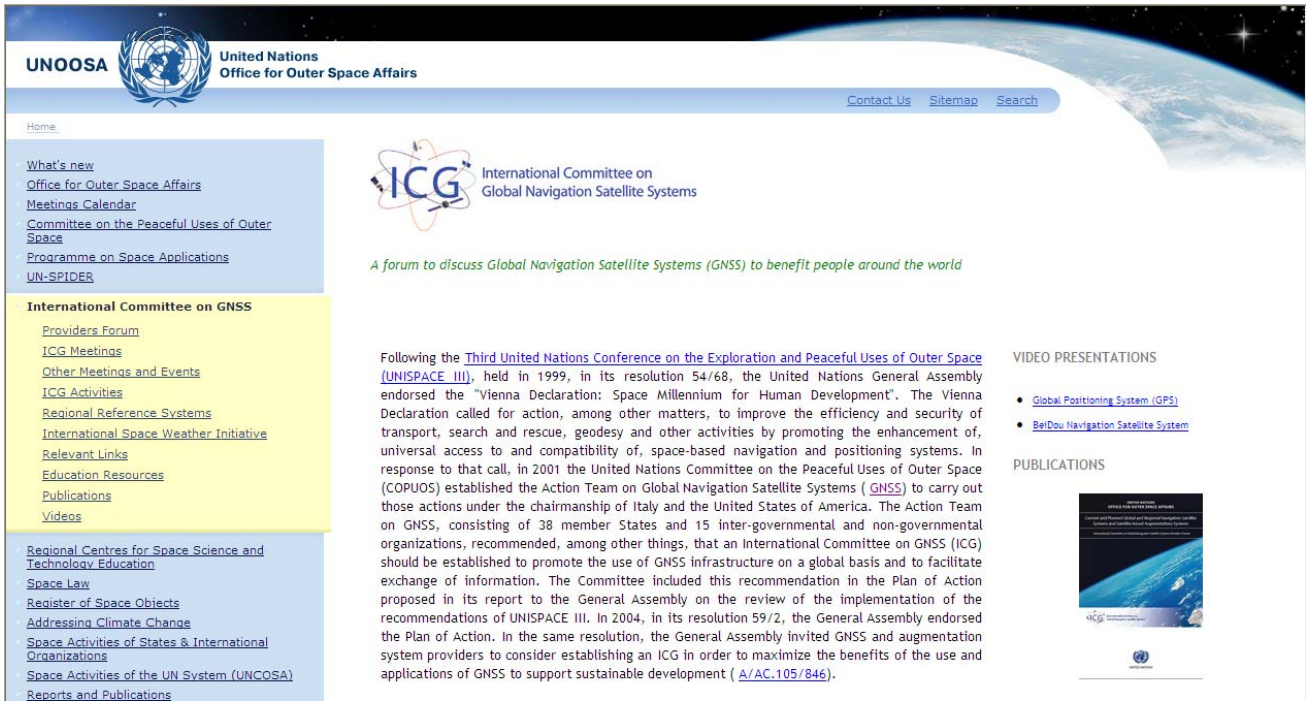
Executive Secretariat of ICG

- ***Participate in and contribute to the international and regional meetings on GNSS***
- ***Assist in the preparations for the annual meetings of the ICG and its Providers' Forum, and for interim planning meetings***
- ***Manage the content and maintain the server of the ICG information portal to reflect developments in ICG and its Providers' Forum: www.icgsecretariat.org***
- ***Prepare and publish the ICG/GNSS related reports/documents***



International Committee on Global Navigation Satellite Systems (ICG)

A forum to discuss Global Navigation Satellite Systems (GNSS)

to benefit people around the world

- **2005: Establishment of ICG**
  - **ICG Membership: Members, Associate Members and Observers**
    - **9 nations & the European Union**
    - **19 organizations (UN system entities, IGOs, NGOs)**

The ICG members cooperate, as appropriate, on matters of mutual interest related to civil satellite-based positioning, navigation, timing and value-added services

International Committee on Global Navigation Satellite Systems (ICG)

ICG Working Groups:

- ***Compatibility and Interoperability (USA and Russian Federation)***
  - ***to identify and encourage use of existing guidelines and standards to enhance compatibility and interoperability;***
  - ***open service information sharing;***
  - ***service performance monitoring;***
  - ***spectrum protection: interference detection and mitigation.***
- ***Enhancement of performance of GNSS services (India and ESA)***
  - ***to promote and coordinate activities aimed at enhancing GNSS performance, recommending system enhancements and meeting future user needs.***
- ***Information dissemination and capacity building (UNOOSA)***
  - ***training/technical workshops for capacity building in developing countries***
- ***Reference Frame, Timing and Applications (IAG, IGS, FIG)***
  - ***to consider geodetic and time references***

International Committee on Global Navigation Satellite Systems (ICG)

2006: First Meeting of the ICG, UNOV, Vienna, Austria

- **Work Plan and Terms of Reference**

2007: Second Meeting of the ICG, ISRO, Bangalore, India

- **Within the ICG is the Providers' Forum, consisting of those countries operating GNSS systems or with plans to develop one (USA, Russian Federation, European Union, China, India and Japan): a venue for coordination and cooperation to improve overall service provision**

2008: Third Meeting of the ICG, JPL, Pasadena, USA

- **Work Plan and Terms of Reference of the Providers' Forum**

2009: Fourth Meeting of the ICG, Roscosmos, Saint-Petersburg, Russia

- **Agreed that every provider should publish documentation that describes signal and system information, policies of provision and minimum levels of performance for its open services;**
- **Endorsed a proposal for a multi-GNSS demonstration project in the Asia/Oceania region**

2010: Fifth Meeting of the ICG, Italy and the European Union, Turin, Italy

- **Addressed aspects of spectrum protection, and interference detection and mitigation;**
- **Considered the issue of integrity for all users where a particular effort is needed to make them aware of the benefits arising from the coming multi-GNSS scenarios;**

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International Committee on Global Navigation Satellite Systems (ICG)

2011: Sixth Meeting of the ICG, Tokyo, Japan

- **Interference detection and mitigation, open service provision and performance monitoring by multi-GNSS networks were the major areas of focus of the WGA;**
- **Indoor positioning, signal authentication, precise positioning, transportation, maritime and space applications were the diverse range of applications and applications-related issues discussed within the WGB;**
- **Training for capacity-building in developing countries, promoting the use of GNSS technologies as tools for scientific applications, the international space weather initiative, regional workshops on applications of GNSS, as well as education and training programmes on GNSS were addressed within the WGC;**
- **Noted that WG D completed development of templates describing the geodetic and timing references for the navigation satellite systems currently represented in the ICG and that the templates be published on the ICG Information Portal. An important new development was the endorsement of the IGS Multi-GNSS Experiment, which follows on from the ICG's previous endorsement of the Multi-GNSS campaign in Asia and Oceania.**

2012: Seventh Meeting of the ICG, Beijing, China, 4 – 9 November

2013: Eighth Meeting of the ICG, Dubai, United Arab Emirates

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Executive Secretariat of the
International Committee on
Global Navigation Satellite Systems

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ICG Information Portal: www.icgsecretariat.org
ISWI Website: www.iswi-secretariat.org