



UNITED NATIONS
Office for Outer Space Affairs

INFORMATION NOTE

United Nations/Moldova/United States of America

Workshop on the Applications of Global Navigation Satellite Systems

**Hosted by and Co-organized with the
Agency for Land Relations and Cadastre of the Republic of Moldova**

Chisinau, Moldova

17 – 21 May 2010

1. Background

The technology of global navigation satellite systems (GNSS) is currently being used in a wide range of sectors including but not limited to: mapping and surveying, monitoring of environment, agriculture and natural resources management, disaster warning and emergency response, aviation, maritime and land transportation.

The Plan of Action, contained in document A/59/174 entitled “Review of the implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space” and endorsed by the General Assembly in its resolution 59/2, presented findings and proposed specific actions in the areas that are important for strengthening and further developing the well-being and the future of all nations. These actions include, among others, maximizing the benefits of the use and applications of global navigation satellite systems to support sustainable development, improving medical and public health services through the use of space technologies, developing a comprehensive, worldwide environmental monitoring strategy as well as improving the management of the Earth’s natural resources.

In its resolution 61/111 of 14 December 2006, the General Assembly noted with appreciation that the International Committee on Global Navigation Satellite Systems (ICG) had been established on a voluntary basis as an informal body to promote cooperation, as appropriate, on matters of mutual interest related to civil satellite-based positioning, navigation, timing and value-added services, as well as the compatibility and interoperability of global navigation satellite systems, while increasing their use to support sustainable development, particularly in developing countries. The details on the ICG are available at the ICG Information Portal at www.icgsecretariat.org

The United Nations Office for Outer Space Affairs, as the Executive Secretariat of the ICG develops a wide range of activities focusing on capacity building, specifically, in deploying instruments for the international space weather initiative (ISWI), developing a GNSS education curriculum, and utilizing regional reference frames that support sustainable development, particularly in developing nations.

In the coming year, the Office will assist the process of the establishment of the ICG Information

Centres for training and information dissemination on global applications of GNSS and their socio-economic benefits for humanity. Such efforts were to 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, and work further towards fostering a more structured approach to information exchange in order to fulfill the reciprocal expectations of a network between ICG and the regional centres, and hence to connect the institutions involved or interested in GNSS applications with GNSS system providers. The regional centres are located in Morocco and Nigeria for Africa, in Brazil and Mexico for Latin America and the Caribbean, and in India for Asia and the Pacific. The details on the United Nations- affiliated regional centres are available at <http://www.unoosa.org/oosa/en/SAP/centres/index.html>

The United Nations Basic Space Science Initiative (UNBSSI) workshops contributed to the deployment of 14 ground-based world-wide instrument arrays (GPS receivers, radio antennas, magnetometers, cosmic ray detectors) for research on climate change, space weather, and ionospheric phenomena. Currently, more than 1000 instruments are operational in these instrument arrays. These instrument arrays will be utilized to constitute the ISWI in the period of time from 2010 to 2012. The details on the ISWI are available at <http://www.iswi-secretariat.org/>

Through regional workshops, expert meetings, pilot projects and training opportunities, the Office for Outer Space Affairs of the Secretariat, as part of the United Nations Programme on Space Applications had been implementing a global navigation and positioning satellite systems thematic area so that GNSS could be used more widely to support sustainable development, in particular in developing countries.

The United Nations/Moldova/ United States of America workshop on the applications of GNSS will be held in Chisinau, from 17 to 21 May 2010. It will address, *inter alia*, the space technology applications such as: remote sensing, precision agriculture, aviation, transport and communications, and e-learning. The workshop will aim at initiating pilot projects and strengthening the networking in the region. This workshop will also address the areas of natural resources management and environmental monitoring by applying GNSS technologies to thematic mapping, forest management and water resources management.

In the area of precision agriculture, the decision-making process could be significantly improved with the use of geospatial technologies, which allow for timely tactical or strategic decision-making at various levels. The use of GNSS could benefit various areas of the agricultural sector, ranging from basic rural cadastre and surveying to advanced precision agriculture. Agro-climatic and ecologic-economical zonings, crop inventory, monitoring and forecasting are only a few examples of agricultural activities where positioning is of paramount importance.

In the area of climate change, different factors and mechanisms drive land use and land cover transformation. In many cases, climate, technology and economics appear to be determinants of land-use change at different spatial and temporal scales. At the same time, land conversion is an adaptive feedback mechanism that farmers use to smooth the impact of climate variability, especially in extremely dry and humid periods. Satellites have for several years been an indispensable resource in global observation of the Earth and weather systems. They bring undeniable added value to global climate models but much remains to be done in developing finer-scale models capable of use in a regional or national setting. Space-based systems such as GNSS has demonstrated its ability to make precise and detailed observations of key meteorological parameters, whose measurement stability, consistency and accuracy should make it possible to quantify long-term climate change trends.

In the area of transport domain, a number of studies have already shown that civil aviation will significantly benefit from the use of GNSS. These benefits include: improved navigation coverage in areas currently lacking in conventional aids, accurate and reliable information about aircraft positions and routes enables safe and efficient management of air traffic, and thereby safety on airport approaches. Road transport applications can automatically revise a route to account for traffic congestion, changes in weather or road works. Similarly, at sea GNSS technologies can provide efficient route planning, collision avoidance and increased efficiency in search and rescue situations. For rail transport, GNSS offers enhanced cargo

monitoring and assists track surveying.

In addition, communication systems, electrical power grids, and financial networks all rely on precision timing for synchronization and operational efficiency. For example, wireless telephone and data networks use GPS time to keep all of their base stations in perfect synchronization. This allows mobile handsets to share limited radio spectrum more efficiently.

With the increased use and application of GNSS and the requirements to relate the Global Positioning Satellite (GPS) solutions with already existing mapping products based on local and national coordinates reference systems, there is an urgent need to establish and determine the transformation data to and from such systems to GNSS reference systems. This will be achieved on full realization of the regional reference frames known as African Geodetic Frame (AFREF), Geocentric Reference System for the Americas (SIRGAS), Reference Frame Sub-Commission for Europe (EUREF) and the European Position Determination System (EUPOS), and the Asia Pacific Regional Reference Frame (APREF). The Executive Secretariat of ICG is utilizing the aforementioned Regional Reference Frames as the next to top level cooperation partners in the implementation of ICG projects at the regional level. This corresponds to the United Nations Economic and Social Commissions for Africa, Latin America and the Caribbean, Europe, Asia and the Pacific, and Western Asia.

2. Objectives

The Workshop will contribute to international cooperation by providing opportunity to exchange updated information on the use of GNSS technology.

The specific objectives of the workshop are to:

- update on-going activities related to the use of GNSS technology in participating countries;
- enhance institutional and human capacity on utilizing GNSS technology using case studies, lessons learned, and experiences from other countries;
- identify the specific needs of individual plans and projects on GNSS at the regional and international levels for near-, medium-, and long-term applications, taking into consideration the local institutional settings, including specific training and capacity-building needs;
- develop a regional plan of action that would contribute to the wider use of GNSS technology and its applications, including the possibility of one or more national or regional pilot projects, or both, in which interested institutions could incorporate the use of GNSS technology.

3. Expected Outcomes

- Recommendations on discussed topics;
- Preliminary agreement of regional cooperation between countries in the region and the reference station networks, such as EUPOS and EUREF;
- Action plan addressing identified issues/concerns.

4. Preliminary programme of the Workshop

The programme will include plenary sessions and sufficient time for discussions among participants to identify the priority areas where pilot projects should be launched and examine possible partnerships that could be established. As a preliminary suggestion the following sessions will be organised:

Thematic Sessions

Session 1: Trends in satellite-based navigation systems

- Global Positioning System (GPS)
- GLObal NAVigation Satellite System (GLONASS)
- European Satellite Navigation System (GALILEO)
- COMPASS/BeiDou Navigation Satellite Systems (CNSS)

Session 2: Initiatives/experiences in GNSS user applications: Case studies and practical cooperation models

- Civil aviation and transportation (roads, highways, rail)
- Marine
- Environment, agriculture, and disaster relief
- Surveying and mapping
- Timing and telecommunications

Session 3: International Space Weather Initiative

- Monitoring Solar-terrestrial interaction at the United Nations Office at Vienna
- Instrument Arrays: Instrumentation and data analysis
- Opportunities for collaboration

Session 4: Education and training in the use and applications of GNSS technologies

- Education and training programmes
- GNSS education tools

Discussion Sessions

Session 5: Regional cooperation in applying GNSS technology

- Issues, concerns and approaches for pilot projects/initiatives, requirements of implementing, mechanisms and resources of implementing
- Possible follow-up projects and initiatives

Session 6: Conclusions and recommendations

- Groups discussion results, and issues and actions to be recommended
- Proposal for future workshops/training courses

Technical Visit

- Visit the Agency for Land Relations and Cadastre and its subsidiary institutes

5. Working Methods

Each speaker is allocated 20 minutes for the presentation and is requested to submit a copy of the presentation in Microsoft PowerPoint format at least two weeks before the commencement of the workshop. It is also necessary to submit an abstract of presentation with a maximum of 300 words taking into account the following details: Paper Title, Author (s) Name(s), Affiliation(s), including e-mail address for the presenting author.

Presentations made at the workshop will be published on the website of the Office for Outer Space Affairs approximately two weeks after the workshop.

6. Sponsorship of the workshop

The Office for Outer Space Affairs of the United Nations, the Agency for Land Relations and Cadastre of the Republic of Moldova are responsible for organizing the workshop. The United State of America through the ICG is co-sponsor of the workshop. **Sponsorship of the workshop still open to interested entities.**

7. Expected participants

The Workshop is being planned for a total of 80 participants including policymakers, decision makers and senior experts from the following groups: international, regional, national and local institutions, United Nations agencies, non-governmental organizations, research and development institutions, and also from industry.

8. Participation requirements

Participants should be in senior managerial or decision-making responsibility at governmental agencies, national and regional institutions, non-governmental organizations or industry. **Equally qualified female applicants are particularly encouraged.**

9. Language of the Workshop

The working language of the Workshop will be English.

10. Financial support

Within the limited financial resources available, a limited number of selected participants will be offered financial support to attend the Workshop. This financial support will defray the cost of travel (a round trip ticket – most economic fare – between the airport of international departure in their home country and Chisinau, Moldova) and/or the room and board expenses during the duration of the Workshop.

11. Deadline for Submission of Applications and Abstracts

The completed application form together with the presentation abstract, properly endorsed by the applicant's Government/ institution, should be mailed to the Office for Outer Space Affairs, United Nations Office at Vienna, Vienna International Centre, P.O. Box 500, A-1400, Vienna, Austria, **no later than Friday, 5 March 2010.** The applicant may also submit his/her application through the Office of the Resident Representative of the United Nations Development Programme in the applicant's respective country. In either case an advance copy of the application form should be faxed directly to the Office for Outer Space Affairs to Ms. Ayoni Oyenyin, Office for Outer Space Affairs, United Nations Office at Vienna, Fax: +43-1-26060-5830

12. Life and health insurance

Life/major health insurance for each of the selected participants is necessary and **is the responsibility of the candidate or his/her institution or Government.** The co-sponsors will not assume any responsibility for life and major health insurance, nor for expenses related to medical treatment or accidents.

13. Further Information and Contact Details

For information regarding the submission of nominations for attendance and funding, please contact **Ms. Ayoni Oyenyin**, United Nations Office for Outer Space Affairs, at the above address and fax number or at the following e-mail address: ayoni.oyenyin@unvienna.org

For information regarding the programme, presentations/abstracts and speakers of the Workshop, please contact **Ms. Sharafat Gadimova**, United Nations Office for Outer Space Affairs at the above address and fax number or at the following e-mail address: sharafat.gadimova@unvienna.org

The focal point for Moldova will be **Ms. Maria Ovdii**, Agency for Land Relations and Cadastre of the Republic of Moldova, E-mail: ovdii@agency.cadastre.md