Report on 1st Asia Oceania Regional Workshop on GNSS
25-26 January 2010, Bangkok, Thailand

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INTRODUCTION

FIG Vice President Matt Higgins gave an invited keynote at the opening of the 1st Asia Oceania Regional Workshop on GNSS, which was held in Bangkok, Thailand on 25 and 26 January 2010. The Workshop was convened by a new organisation known as Multi-GNSS Asia with strong support from the Japan Aerospace Exploration Agency (JAXA), Japan's Satellite Positioning Research and Application Center (SPAC), Thailand's Geo-Informatics and Space Technology Development Agency (GISTDA) and the United Nations International Committee on Global Navigation Satellite Systems (ICG). Chris Rizos, Vice President of the International Association of Geodesy and member of the governing board of the International GNSS Service (IGS) has been closely involved in the establishment and development of the Multi-GNSS Asia concept and is a co-chair of the Steering Committee.

Figure 1: Workshop Attendees

THE WORKSHOP

The purpose of the workshop was to bring together interested parties to discuss the implications of next-generation of Global Navigation Satellite Systems. When the idea for the workshop was originally proposed by JAXA, it was expected that perhaps 80 people might attend. However, the growing interest in topics related to the coming Multi-GNSS era, means that the final attendance reached 195 participants from 95 organizations across 18 countries, with representations from the GNSS providers, universities, related research institutes, government agencies and the private sector. The opening session included:

- Matt Higgins' keynote on *"How Multi-GNSS Applications Contribute to Sustainable Regional Economic Growth"*;
- Xuan Zengpei from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) on *"Potential Applications of GNSS in Socio-economic Development in the Asia-Pacific region"*, and;
- Sharafat Gadimova from the United Nations Office of Outer Space Affairs on *"ICG development and its activities"*.

The second session of the workshop saw a series of presentations on the status of all of the major GNSS sub-systems, including:

- China: Compass/BeiDou Navigation Satellite System (CNSS);
- European Community: European Satellite Navigation System (Galileo) and European Geostationary Navigation Overlay Service (EGNOS);
- India: GPS and GEO Augmented Navigation System (GAGAN) and Indian Regional Navigation Satellite System (IRNSS);
- Japan: Quasi-Zenith Satellite System (QZSS) and MTSAT (Multi-functional Transport Satellite) Satellite-based Augmentation System (MSAS);
- Russian Federation: Global Navigation Satellite System (GLONASS) and Wide-area System of Differential Corrections and Monitoring (SDCM);
- United States: Global Positioning System (GPS) and Wide-area Augmentation System (WAAS).

The workshop was conducted in Thailand because Multi-GNSS issues are particularly relevant in the Asia Oceania region because it will be the area of the earth with the largest combined coverage from the new systems (see Figure 2). This was highlighted in the next sessions where Satoshi Kogure from JAXA, encouraged attendees to focus on one of the key workshop objectives by outlining the concept of a "*Asia-Oceania Multi-GNSS Demonstration Campaign*". That is planned to involve the establishment of Continuously Operating Reference Stations (CORS) with new Multi-GNSS receivers.

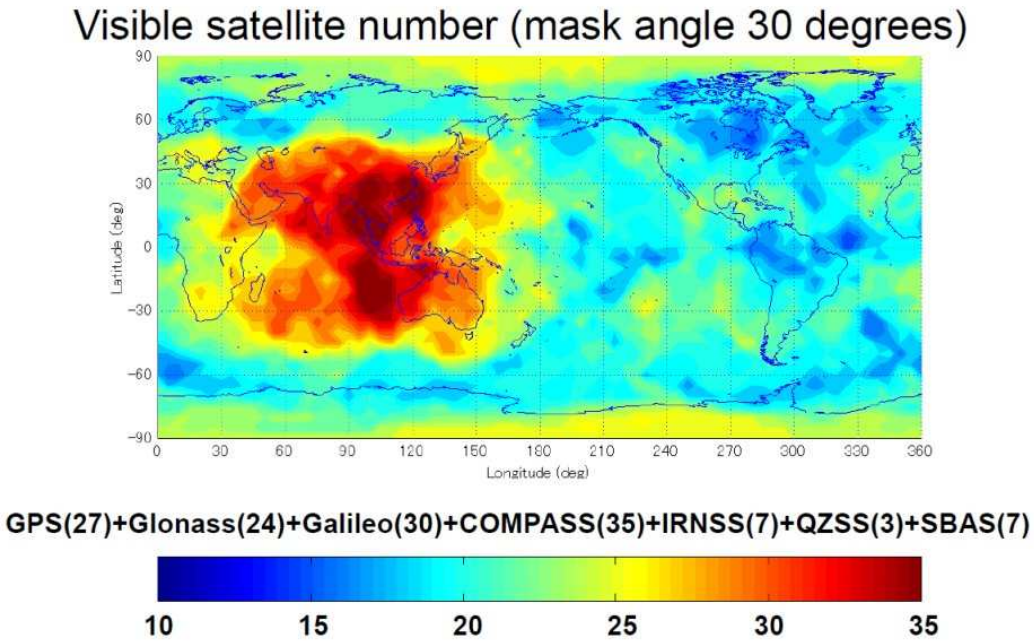

Figure 2 The Asia Oceania "Hot Spot" for Multi-GNSS Coverage

Following the scene setting sessions, there were 32 more detailed presentations across 6 applications sessions under the following topics:

- Infrastructure, augmentation technologies;
- Precise Positioning;
- Ionospheric Observation;
- Disaster Mitigation and Management;
- Intelligent Transport Systems, Mapping and Location Based Service, and;
- Timing and Others.

On the second day of the workshop the attendees broke into four panel discussion groups to begin the process of creating projects to explore issues under each broad topic. The four panel discussion group topics were:

A. Multi-GNSS network establishment;
B. Precise positioning;
C. Disaster management;
D. Intelligent Transport System, Mapping and Location Based Services

It is planned that the leaders of the discussion groups will now work with all parties who expressed interest in Bangkok to develop concrete project proposals for developmental activities and/or demonstrators. Those project proposals will then be considered by the Multi-GNSS Asia Steering Committee. It is expected that the best project proposals will be those that develop or demonstrate the unique aspects of the coming GNSS; such as the correction broadcast capabilities of the L1-SAIF Signal of Japan's QZSS or the SMS capabilities of China's Compass.

FIG INTEREST

FIG and its member associations in the region will have an interest in all of these topics and the relevant Commissions of FIG (notably Com 5) will need to consider the appropriate level of involvement in relevant project activities. A particularly useful development from the workshop will be the *Multi-GNSS Demonstration Campaign*. That will involve the establishment of a series of Continuously Operating Reference Stations (CORS) with new Multi-GNSS receivers. As well as the possibility of introducing Multi-GNSS CORS into developing countries that might not otherwise be able to participate, the network of new CORS should also be useful for initiatives such as the Asia-Pacific Reference Frame project (APREF). The Multi-GNSS Demonstration Campaign will also have strong involvement and support from the IGS and will therefore help inform future decisions within the IGS and geodetic agencies generally about the appropriate receiver equipment for CORS under a Multi-GNSS future.

It is therefore intended that FIG Vice President Matt Higgins will continue to monitor developments in the Multi-GNSS Asia organisation and ensure cooperation with relevant space agencies in the region and with IGS and with coordination by the UN ICG. Matt will also liaise with the incoming Chair of FIG Commission 5 to ensure FIG involvement in any of the Multi-GNSS projects that develop and have relevance for FIG, its global partners, its member associations and the profession as a whole.