GGOS Working Group for Ground Networks and Communication

GGOS Steering Committee Meeting

San Francisco, CA

December 16, 2009

Role of the Bureau

- Develop a strategy to design, integrate and maintain the fundamental geodetic network of co-located instruments and supporting infrastructure in a sustainable way to satisfy the long-term (10 - 20 years) requirements identified by the GGOS Science Council.
- At the base of such a strategy would be the sensors and the observatories situated around the world providing the timely, precise, and fundamental data essential for creating the GGOS products.
- Primary emphasis would be placed on sustaining the infrastructure needed to maintain the evolving global reference frames, while at the same time ensuring the broader support of the scientific applications of the collected data;
- The strategy would exploit synergistic opportunities to better integrate or co-locate with the infrastructure and communications networks of the many other Earth Observation disciplines organized under GEOSS should be considered and exploited.

- Immediate Role focuses on the Reference Frame with an accuracy of 1.0 mm and 0.1 mm/year stability => Global Network of Co-located Geometric Techniques

State of the Current Network

Current Network

- IGS Stations about 417
- ILRS Stations – 40
- IVS Stations – 40
- IDS Stations - 57

But –

- only two stations that have all four techniques;
- sixteen stations with three techniques
- Although all of the Services have gaps in geographic coverage, the gaps in SLR and VLBI are of particular concern.
- All of the networks are an anachronistic mix of legacy systems (in some cases decades old) and modern systems.
- Performance differences between stations and system deterioration over time have seriously compromised overall network performance.

Bureau Tasks

The work of the Bureau will be a follow-on activity to the work of the current GGOS Working Group on Ground Networks and Communications. It is recognized from the onset, that although the Bureau will provide coordination among the Services, it is really an entity that helps to represent the Services within GGOS and requires their support in order to function. Initially the Bureau will focus on the tasks below. It is assumed that other tasks will be undertaken as the need arises:

- **Promote communication and integration among the Services;**
- **Develop and maintain a ground network station information base and data product directory;**
- **Develop a model that predicts the accuracy and stability of the reference frame as a function of the number of co-located SLR, VLBI, GNSS, and DORIS stations, their geographic distribution, their data quality and yield, and other properties to address GGOS requirements; utilize the model to provide guidelines for the design of the core ITRF network;**
- **Estimate the size and distribution of the GNSS network necessary to provide reference frame access globally, commensurate with GGOS requirements;**

Bureau Tasks (2)

- **Work with the Satellite Missions Bureau to establish the design of the ground network needed to meet mission POD requirements;**
- **Work with the IGFS to define its network requirements and to scope the size and geometry of the IGFS ground network;**
- **Establish and maintain a database of co-location survey vectors, data and procedures used to infer these vectors, and a database of misclosures between the co-location vectors and the analysis results**
- **Seek more effective ways to monitor inter-technique vectors at co-location sites;**
- **Maintain a database for co-location-vector time series;**
- **Identify and facilitate the communications services necessary to support data flow from the stations through to archiving of data and data products;**
- **Establish a database of the meteorological instruments, measurements, and procedures at all network stations; review the information for consistency and establish standards for meteorological measurements.**

GGOS Bureau for Networks and Communication

Primary Organization: NASA/GSFC

Supporting Organizations: IGS, IVS, ILRS, IDS, IGFS, IERS

Bureau Director: Dr. Michael Pearlman/CfA

Associate Director: Ms Carey Noll/ NASA GSFC

Science Coordinator: Dr. Erricos Pavlis/JCET

Co-location Coordinator: Dr. Zuheir Altamimi

Service Representatives

- **IERS: Bernd Richter**
- **IGS: Steve Fisher (tentative)**
- **IVS: Dirk Behrend**
- **IDS: Frank Lemoine (interim)**
- **ILRS: Michael Pearlman**
- **IGFS: Steve Kenyon**