

The GGOS Bureau of Networks and Observations



- Advocate for implementation of the global space geodesy network of sufficient capability and geographic coverage to achieve data products essential for GGOS
- Serve as a coordinating point for the Services to meet, discuss status and plans, and examine common paths for meeting GGOS requirements
- Director: Michael Pearlman/CfA, USA

http://176.28.21.212/en/bureaus/bno/

GGOS Bureau of Networks and Observations: Overview

- The GGOS Bureau of Networks and Observations (BNO) works with the IAG and its Services to develop a strategy to design, integrate and maintain the fundamental infrastructure in a sustainable way to satisfy the long-term (10 - 20 years) GGOS requirements.
- The effort is to 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.
- The Bureau is constituted mainly from the Geometric Services (IGS, IVS, ILRS, IDS) to support the maintenance and improvement of the reference frame, but efforts are now underway to integrate other services and techniques that would enhance geodetic products of interest to GGOS.
- The geodetic network of core and co-location sites will evolve as deployment and upgrade of stations occurs over many years.
- The utility of the network output will be the product of network configuration, mix of technologies, adherence to proper operational and engineering procedures, and our making best use of the space geodesy data.

Roles and Tasks of the Bureau

- Advocate for the implementation of the global space geodesy infrastructure of sufficient capability and geographic coverage to achieve data products essential for GGOS, with high priority on the reference frame.
- Serve as a coordinating point for the IAG Services, for discussion of status and plans, and common paths for meeting GGOS requirements.
- Encourage partnerships to implement core and co-locations sites.
- Monitor and project the status and evolution of the GGOS space geodesy network in terms of location and performance (with the IAG services).
- Provide simulations and analyses to estimate the improvement in data product quality over time as the infrastructure improves.
- Adopt and implement GGOS metadata system for data products and infrastructure.
- Maintain and update the "Site Requirements for GGOS Core Sites" document (with the IAG Services).
- Continue the Bureau's "Call for Participation in the Global Geodetic Core Network: Foundation for Monitoring the Earth System" and work with new potential groups interested in participating.





Organization of the Bureau

Participants:

- **Bureau Leadership:**
 - Director (Michael Pearlman/CfA, USA)
 - Secretary (Carey Noll/NASA GSFC, USA)
 - Analysis Coordinator (Erricos Pavlis/JCET UMBC, USA)
 - IERS Representative (Sten Bergstrand/SP, Sweden)

IAG Service Representatives:

- + IGS (Ruth Neilan, Steve Fisher/JPL, USA)
- IVS (Hayo Hase/BKG, Germany; Chopo Ma/NASA GSFC, USA)
- ILRS (Giuseppe Bianco/ASI, Italy; Zhang Zhongping/Shanghai Obs., China)
- IDS (Jérôme Saunier/IGN, France; Pascale Ferrage/CNES, France)
- IGFS (Riccardo Barzaghi/PM, Italy, George Vergos/UT, Greece)
- PSMSL (Lesley Rickards/BODC, UK; Tilo Schoene/GFZ, Germany)
- **Standing Committees:**
 - PLATO: Performance Simulations and Architectural Trade Offs (Daniela Thaller/BKG, Germany; Benjamin Maennel/GFZ, Germany)
 - Data and Information Systems (Guenter Stangl/OEAW, Austria; Carey Noll/NASA GSFC, USA)

IAG Service Representatives

Systems

Co-location

Standing Committee on Satellite Missions

and Architectural Trade-Offs (PLATO)

IERS Working Group on Site Survey and

Standing Committee on Data and Information

Standing Committee on Performance Simulations

- Missions (Juergen Mueller/U. Hannover, Germany; Roland Pail/TUM, Germany)
- IERS WG on Site Survey and Co-location (Sten Bergstrand/SP, Sweden; John Dawson/GA Australia)

Recent Presentations and Publications

Early simulation studies showed a requirement for: **GGOS Bureau of Networks and Observations**

~32 globally distributed, well positioned, new technology, co-location sites will be required to define and maintain the reference

(4)

(3)

space geodesy network

North Pacific

South Pacific

frame

South America

- ~16 of these co-location stations
- must track GNSS satellites with SLR to calibrate the GNSS orbits which are used to distribute the reference frame
- Will require time, significant resources, and strong international participation
- Future network will be a Conceptual distribution for a global combination of core and co-location sites with ample geographic distribution

	PROJECTION SPACE GEODESY NETWORK															1 Г							
	Terminology	VLBI SLR GNSS	S/X and VGOS GPS (L) and Multi-constellation (MC)													Global Geodetic Observing System (GGOS)							
_			Current 5 years hence 10 years hence												GGOS Requirements								
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- M. Pearlman, C. Ma, C. Noll, E. Pavlis, H. Schuh, T. Schoene, R. Barzaghi, S. Kenyon, "The GGOS Bureau of Networks and Observations and an Update on the Space Geodesy Networks", Abstract EGU2015-7420, presented at EGU 2015 General Assembly, April 13-17, 2015, Vienna, Austria, April 12-17, 2015.
- M. Pearlman, E. Pavlis, C. Ma, C. Noll, D. Thaller, B. Richter, R. Gross, R. Neilan, J. Mueller, R. Barzaghi, S. Bergstrand, J. Saunier, M. Tamisiea, "Update on the Activities of the GGOS Bureau of Networks and Observations", Abstract No. 10095. Presented at European Geosciences Union General Assembly, April 17-22, 2016.
- C. Noll, "GGOS: Global Geodetic Observing System", presented at 2016 WDS Members' Forum, Denver, Colorado, September 11, 2016.
- G. Stangl, C. Noll, "GGOS: The Global Geodetic Observing System" (poster), presented at 2016 WDS Members' Forum, Denver, Colorado, September 11, 2016.
- M. Pearlman, C. Noll, C. Ma, E. Pavlis, R. Neilan, J. Saunier, T. Schoene, R. Barzaghi, D. Thaller, S. Bergstrand, J. Mueller, "The GGOS Bureau of Networks & Observations: An Update on the Space Geodesy Network & the New Implementation Plan for 2017-2018", Abstract No. EGU2017-10698, presented at European Geosciences Union General Assembly 2017, Vienna, Austria, April 24-28, 2017.
- M. Pearlman, H. Schuh, D. Angermann, C. Noll, "The Global Geodetic Observing System (GGOS) – Its Role and Its Activities". JpGU-AGU Joint Meeting, Chiba, Japan, May 22-26, 2017.
- M. Pearlman, C. Ma, R. Neilan, C. Noll, E. Pavlis, J. Saunier, T. Shoene, R. Barzaghi, D. Thaller, S. Bergstrand, J. Mueller, "The GGOS Bureau of Networks and Observations: Activities and Plans". Presented at IAG-IASPEI, Kobe, Japan, July 30-August 04, 2017.

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