

GGOS Bureau of Networks and Observations Report

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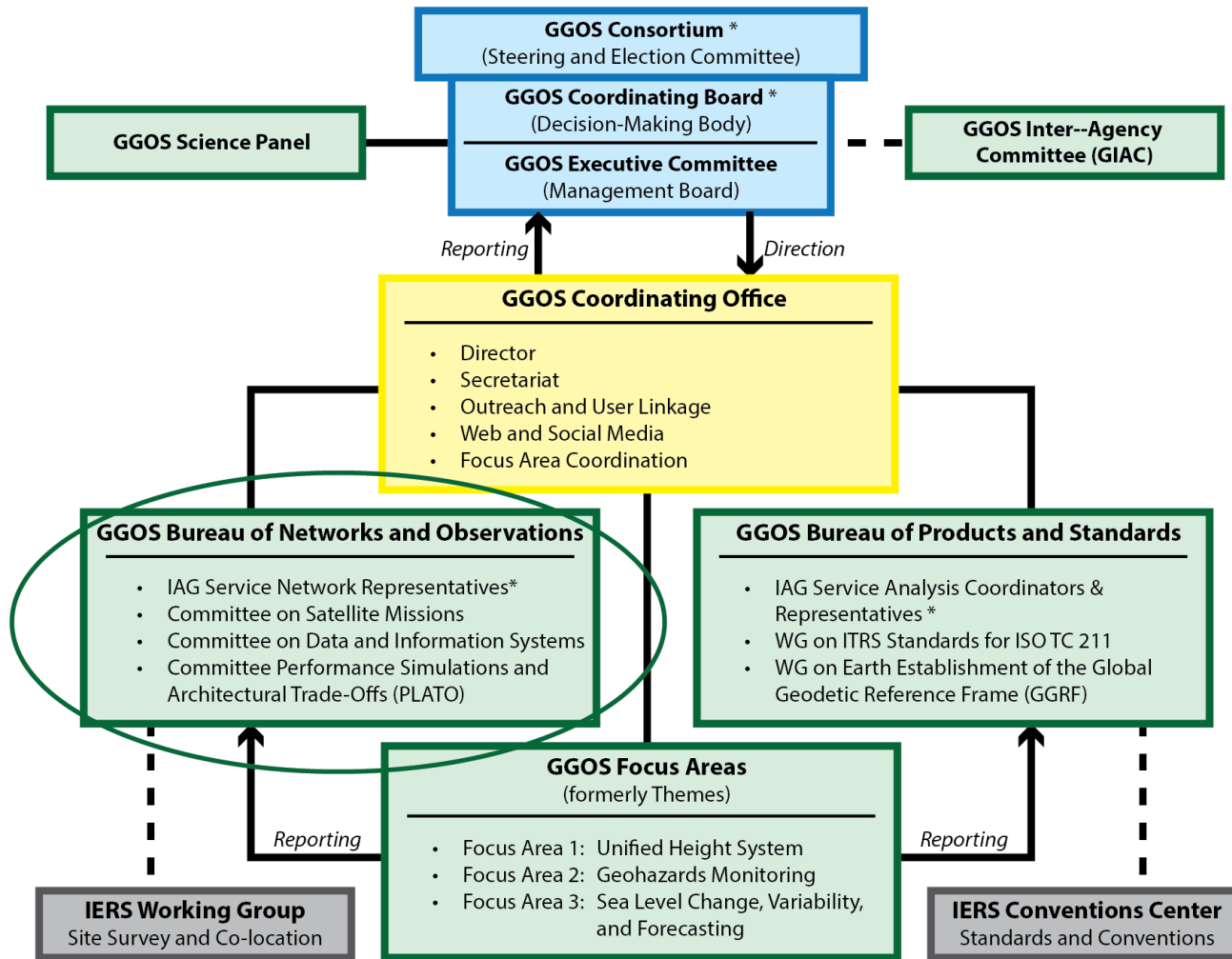
GGOS Bureau of Networks and Observations

Technical University of Vienna

April 22, 2017



GGOS Organization



*GGOS is built upon the foundation provided by the IAG Services, Commissions, and Inter-Commission Committees

Key Bureau Personnel



Position	Resource	Entity Contributing
Director	Mike Pearlman	CfA (USA)
Deputy Director	TBD	TBD
Secretary	Carey Noll	NASA (USA)
Analysis Specialist	Erricos Pavlis	UMBC (USA)
IVS Service Representatives	Hayo Hase Chopo Ma	BKG (Germany) NASA (USA)
ILRS Service Representatives	Giuseppe Bianco Wu Bin	ASI (Italy) SHAO (China)
IGS Service Representatives	Ruth Neilan Steve Fisher	JPL (USA) JPL (USA)
IDS Service Representatives	Jérôme Saunier Pascale Ferrage	IGN (France) CNES (France)
IGFS Service Representatives	Riccardo Barzaghi George Vergos	PM (Italy) UT (Greece)
PSMSL Service Representatives	Lesley Rickards Tilo Schöne (IGS TIGA-WG)	BODC (UK) GFZ (Germany)
IERS Representatives	Sten Bergstrand	SP (Sweden)
Standing Committee on Performance Simulations & Architectural Trade-Offs (PLATO) – joint with IAG Commission 1	Daniela Thaller Benjamin Maennel	BKG (Germany) GFZ (Germany)
Standing Committee on Data and Information	Günter Stangl Carey Noll Australian Rep/UNAVCO (TBD)	OEAW (Austria) NASA (USA)
Standing Committee on Satellite Missions	Jürgen Müller Roland Pail	IfE (Germany) TUM (Germany)
IERS Working Group on Survey Ties and Co-Location	Sten Bergstrand John Dawson	SP (Sweden) GA (Australia)

- Focus primarily on the geodetic networks and the functions that support them, and in some cases the disposition of their products.
- At the moment we have the network requirements for the support of the Terrestrial Reference Frame (TRF).
- Work is underway with the IGFS to define the gravity field requirements and data products; also tide gauges;
- The measurement requirements for other themes and focus areas should be included once they are defined;
- Work with the Bureau of Products and Standard (BP&S), and the Focus Areas to quantify new network requirements.

- Monitor and project the status and evolution of the space geodesy network and project future network performance capability base on the knowledge and plans that we have,
- Advocate for implementation of the global space geodesy network of sufficient capability to achieve data products essential for GGOS;
- Organize a multi-technique community for the services to work and plan together;
- Document information on networks and infrastructure
- Help provide some guidance and recommendations;
- **But – network deployment, upgrade, and operations is all done by the network participants and funded by the respective agencies.**

- **Complete the Bureau Implementation Plan for 2017- 2019**
- **Provide a venue for the services, committees and joint working groups** to share and discuss plans, progress, and issues; develop and monitor multi-entity efforts to address GGOS requirements;
- **Actively promote and encourage** maintenance, upgrading and expanding of the global geodetic ground-based infrastructure needed to meet requirements for GGOS;
- **Maintain “Requirements for GGOS Core Sites” document** (with the IAG services);
- **Monitor and project the status and evolution** of the GGOS space geodesy network in terms of location and performance (with the IAG services); (Next survey August 31, 2017);
- **Continue Bureau’s “Call for Participation in the Global Geodetic Core Network”**; work with new groups interested in participating; meet with interested parties; encourage partnerships;
- **Encourage/facilitate integration of other ground networks** (gravity field, tide gauges, etc.) into the GGOS network to support GGOS requirements; advocate for installation of GNSS receivers at appropriate tide gauges;
- **Work with the GGOS BP&S to define networks requirements** for new and improved data products (e.g. gravity field, etc.) and to seek ways of implementing and encouraging deployment of the field measurement systems;

- Standing Committee on Performance Simulations & Architectural Trade-Offs (PLATO) (Joint with IAG Commission 1) – Next meeting Thursday 11:00 – 13:00;
Use analyses and simulation techniques to model and predict network performance based on projected station configurations and capability including the co-location opportunities in space; examine options and trade-offs for network planning and data product improvement;
- Standing Committee on Satellite Missions
Advocate and improve communications with current and future space missions that may enhance GGOS activities;
- IERS Working Group on Survey Ties and Co-location (IERS WG)
Support site tie and eccentricity information and archiving, improve survey standards and procedures, and outreach to expand the survey community that currently supports the networks;
- Standing Committee on Data and Information
Design and implement a GGOS metadata system that is discoverable and interoperable, easily transferable/shared via web services, and based on internationally recognized data exchange methods

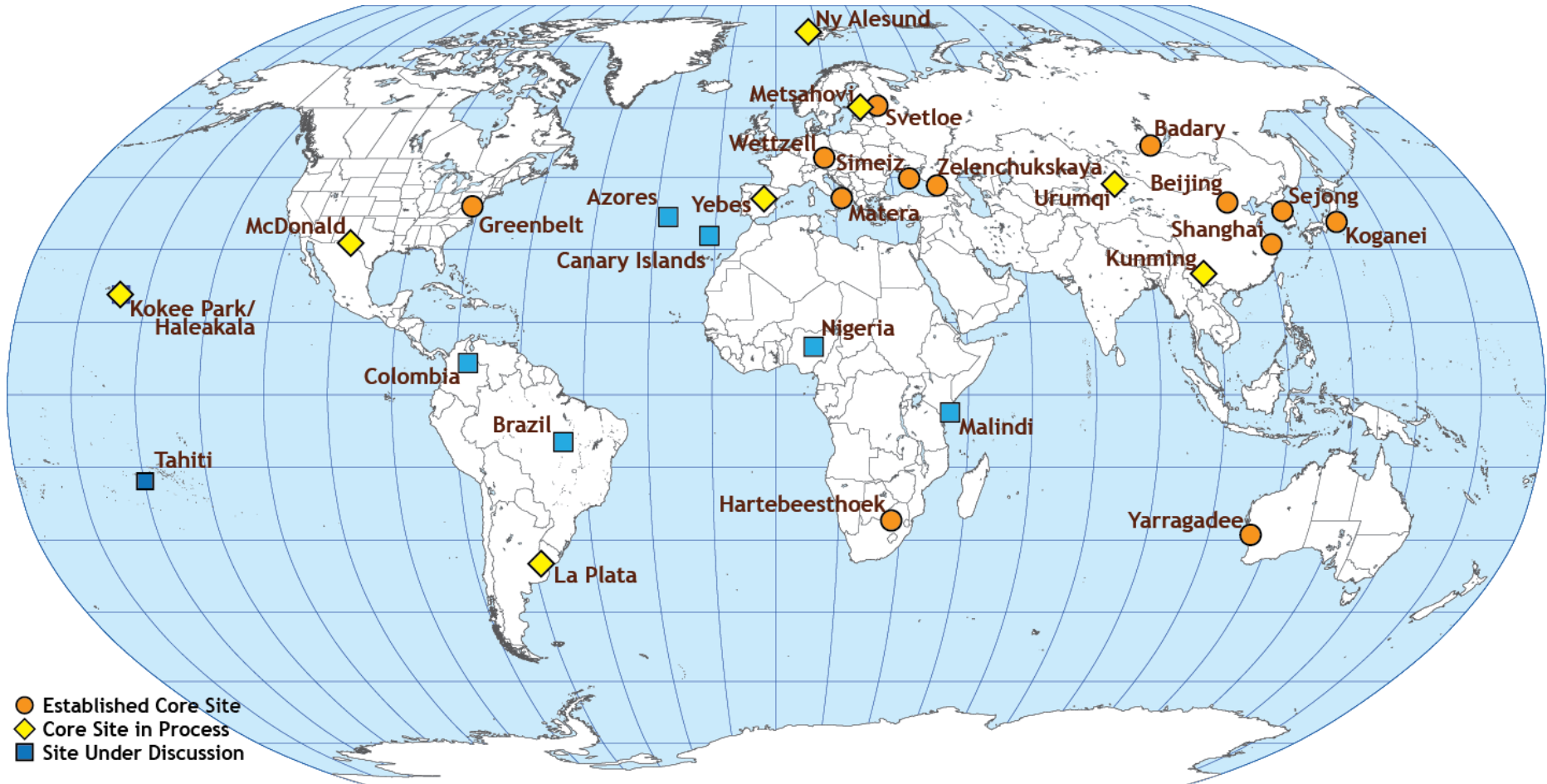
Activity Highlights - 1



- Circulated the Bureau Implementation Plan for 2017 – 19; discussion the Bureau meeting on Wednesday evening;
- Networks continued to expand and plan for expansion: NASA SGP, Russian network, BKG, Chinese, Norway, Finland, South Africa, Australia, other new CORE and Co-location stations underway; new satellites;
- New technologies being deployed by the Services;
- Met with representatives from Brazil, Italy, Spain, Russia, Saudi Arabia, France and others to discuss opportunities and planning for network expansion;
- Wrote letters of support and sent supporting material;
- Held Bureau Meetings at AGU, EGU, and GGOS Days for status review and plans
- Giving talks and posters everywhere (AGU, EGU, AOGS, JpGU/AGU, GGOS Days, -----)

- **Committee on Data and Information:** Planned outlined for a 2-phase GGOS Metadata development scheme and began implementing Phase 1;
- **Committee on PLATO:** Many publications and presentations on test solutions and simulations to project future network capability based on information provided by the stations, covering a number of scenarios and operational conditions; simulations on E-grasp and other space targets; LLR;
- **Committee on Satellite Missions:** Continued the evaluation of satellite contribution to GGOS 2020 goals (with particular focus on gravity field), developed inventory/repository of current and near-future satellite missions relevant to GGOS;
- **IERS Working Group on Site Surveys and Co-Location:** Continued working on site survey procedures and encouraging participation in site surveys for co-location;

Present and Projected CORE Network



- The reference frame baseline requirements are levied by the GGOS 2020 document. The most stringent requirement comes from sea level rise:
- Accuracy of 1 mm, and stability at 0.1 mm/yr, a factor of 10-20 beyond current capability;
- Accessibility: 24 hours/day; worldwide;
- The space segment is currently defined by LAGEOS-1 and -2, LARES, GNSS, DORIS, and the quasars; more satellites to follow;
- **The ground segment is defined by a global distributed network of “modern technology”, co-located SLR, VLBI, GNSS, DORIS stations and other ground-based measurements (e.g., gravimeters, tide gauges, etc.), locally tied together with accurate site ties;**
- A dense network of GNSS ground stations to distribute the reference frame globally to the users;

- Co-location sites (non-core sites) will continue to play an essential role in our data products;
- Quality of our output will be the product of:
 - network core sites;
 - co-location sites
 - mix of technologies;
 - adherence to proper operational and engineering procedures, and
 - making best use of our data.