

Request for Proposal for next Analysis Center Coordinator

2013-Nov-30

Summary

The IGS invites proposals for a successor to the current Analysis Center Coordinator, starting in 2016. Here are the key dates:

- 30 November 2013—this call for proposals
- 01 June 2014—deadline for submission of expression of interest for next ACC
- 31 September 2014—deadline for submission of response for next ACC
- 31 December 2014—selection of next ACC
- 01 July 2015—beginning of test and validation phase for new ACC
- 01 January 2016—full operational responsibility by new IGS ACC

Background

The IGS Analysis Center Coordinator (ACC) has overall responsibility for generating the main official IGS combined products. During the period 2008 through 2015, the IGS ACC functions are performed by NOAA's National Geodetic Survey (NGS) in Silver Spring, Maryland, USA. Currently, there are three IGS product lines for GNSS satellite orbits and clocks, namely the Final (GPS and GLONASS independently), the Rapid (GPS only), and the Ultra-rapid (GPS and GLONASS independently) products. During previous periods, the ACC functions have been performed by the Deutsches GeoForschungsZentrum (GFZ, Potsdam, Germany during 2003-2008), Center for Orbit Determination in Europe (CODE, Bern, Switzerland and Vienna, Austria during 1999-2003), and Natural Resources Canada (NRCAN, Ottawa, Canada during 1994-1998).

Certain IGS product combination tasks are shared with the ACC. For the Final products, those components involving the terrestrial reference frame, including the Earth rotation parameters, are produced by a combination of SINEX file submissions at Institut National de l'Information Géographique et Forestière (IGN, France). (This function was at NRCAN in Ottawa prior to 2010.) The internally realized timescales of the IGS, formed by a weighted ensemble of the frequency standards available in the IGS clock products, are maintained by the Naval Research Laboratory (NRL, Washington, DC, USA). Such high-stability timescales are supported for the IGS Rapid and Final GPS products, but not yet for GLONASS or the Ultra-rapids.

Other IGS products are formed by separate working groups not directly linked to the ACC, such as ionosphere maps, tropospheric path delays, and real-time services. Nevertheless, overall consistency should be maintained across all IGS products.

The present ACC combination system traces back to the early 1990s with many diverse components, written in a variety of coding languages, and many modifications since that time to

accommodate changes. While the previous call, which was posted in August 2009 (IGSMail-5984), requested proposals for a next-generation combination system (ACC2.0), none were submitted. The legacy system continues to be used, but any efforts by the new ACC to incorporate newer GNSS constellations, new signals, or otherwise improve the existing combination system are encouraged. IGS is aiming at fully consistent Multi-GNSS products. The activities related to the IGS Multi-GNSS Experiment will eventually be fully integrated into the standard product streams.

The term of the current ACC will expire at the end of 2015. A new ACC will be needed to replace Jake Griffiths (NGS) starting January 1, 2016, with a transition and validation phase starting preferably no less than six months earlier.

The ACC is a fundamental task within the IGS.

Expressions of interest to succeed NGS starting January 1, 2016 are requested at the earliest opportunity, but no later than 01 June 2014.

Selections for the next ACC will be made by 31 December 2014, with a hand-over process beginning no later than mid-2015.

Guiding Principles for ACC Combinations

The following are the historic principles that have guided IGS analysis product combinations:

1. **Software independence**—The IGS products should not favor any particular AC software design. In particular, least squares methods cannot have a preference over filter methods.
2. **Diversity of approaches**—Diverse modeling approaches are preferred as long as they are physically reasonable and compatible, and conform to accepted conventions. Only in this way can progress be achieved. Nevertheless, all AC solutions must attain comparable levels of accuracy in order for the product combinations to benefit.
3. **Objective weighting**—The combination strategy should use AC weights that are objectively based, usually on the basis of best agreement with the mean or with some external standard of sufficient accuracy.
4. **Unconstrained**—AC solutions should be either unconstrained or only minimally constrained. Generally the IGS should strive to move in the direction of lesser/weaker solution constraints, a goal that has been substantially advanced during the present ACC tenure.

Specific ACC Tasks

1. **Working Groups & Pilot Projects**: The ACC is an ex officio member of all IGS working groups and pilot projects, and is also a voting member of the IGS Governing Board. Responsibilities described in the IGS Terms of Reference are given at igs.org/organization/bylaws.html.
2. **Core products**: The ACC is responsible for forming and distributing the IGS core products, i.e.:

- a. Ultra-rapid GPS & GLONASS satellite orbits and clocks with ERPs, presently issued four times daily with an initial delay of 3 hr;
- b. Rapid GPS satellite orbits and clocks with ERPs and station clocks, presently issued daily with a delay of 17 hr;
- c. Final GPS & GLONASS satellite orbits and clocks with station clocks, presently issued weekly with a delay of about 12 days.

Expansion of this product set to include new GNSS constellations or to implement other enhancements is encouraged, provided that the ACs and other supporting organizations approve and contribute.

3. **Reprocessed products:** From time to time, the IGS expects to reprocess all GNSS observational data using the latest models and procedures to achieve the highest possible product accuracy and to maintain long-term consistency.
 - a. Detailed specifications and performance metrics for these products are given at acc.igs.org. In the future, new or expanded combination products might be indicated.
4. **Coordinate with TRF and clock products:** The formation of the Rapid and Final clock time scales and the Final station coordinate/ERP products requires close interaction with the Coordinators for those products. Electronic exchanges of data files must be synchronized and monitored in order to avoid product interruptions.
5. **Monitor AC products:** The ACs must be promptly informed whenever problems occur in the quality or availability of their input solutions and it is sometimes necessary to intervene in the combination process to minimize adverse impacts. Changes made by ACs often require corresponding changes in the ACC procedures.
6. **Monitor ACC products:** The quality and reliability of the IGS official products must be continuously monitored for any deficiencies, which must be promptly addressed. Difficulties with the flow of product files to the IGS Data Centers must also be resolved as quickly as possible.
7. **Report station data problems:** Many types of data anomalies at the tracking stations can have adverse effects on the IGS products. When these are detected it is important to notify the station operators promptly.
8. **Maintain external interactions and interfaces:** The ACC procedures depend on data files from certain external organizations which must be continuously updated. Likewise, the ACC products flow continuously to various external users. These interfaces must be reliably maintained and updated as needed, which requires routine interactions with such external groups as the International Earth Rotation and Reference Systems Service (IERS). Also included in this activity is maintenance of the IERS Conventions upon which the IGS data reductions rely.

9. **Research and improvements:** The ACC should normally play an active role, together with the ACs and other scientists, in evaluating the quality and comprehensiveness of present IGS products and developing approaches for their improvement.
10. **IGS Workshops:** The ACC ordinarily identifies key technical topics that should impact the planning and organization of IGS workshops.
11. **Website:** The ACC maintains a website of information concerning the IGS core products, their quality, and other information helpful to the ACs and general users.
12. **Outreach:** It is necessary to provide users information about the combined IGS products on a regular basis, as needed.
13. **Reports:** The results of each ACC product combination are documented in regular reports distributed by the IGS. Other reports and scientific papers should be prepared to document future developments and accomplishments.

It is expected that the transition to the next ACC will require a visit to NGS by personnel from the successor host organization.

Responses

Expressions of interest and proposals for the successor to the current Analysis Center Coordinator should be addressed to the IGS Central Bureau (igs cb at igs cb.jpl.nasa.gov) with the following information:

- names of key personnel
- level of support to be provided
- computing system to be used for tasks and other technical information
- available starting date
- duration of commitment

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References

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