International Association of Geodesy

International Gravity Field Service

IGFS Splinter Meeting at GGHS2016, September 20, 2016, 12:00-13:00

Meeting Agenda

1. Internal IGFS issues
    a. connections between gravity Services and IGFS
    b. improvements of the relationships between IGFS-CB and the Services
    c. Services integration making their work more visible
    d. Services communication

2. Connections/actions between IGFS and GGOS
    a. inclusion of IGFS and Services products in the global database that collects GNSS data
    b. disclaimer on the use of the GGMs (ICGEM) and geoid solutions (ISG)
    c. ISO standards for the gravity field products in the form of GGOS ones (ISO 19115)

3. AOB

The 1st IGFS meeting for 2016 has been opened by Riccardo Barzaghi (**RB**), IGFS President, by welcoming all participants to this splinter meeting. RB mentioned that IGFS has gone a long way since the last IUGG General Assembly in 2015, since a new IGFS Central Bureau (CB) has been established, following a public call for hosting it. Finally, in April 2016 it was decided that the IGFS CB will be hosted at the Department of Geodesy and Surveying of the Aristotle University of Thessaloniki, with Georgios S. Vergos (GSV) as its Director. RB mentioned that the new CB would have to overcome the shortcomings identified during the previous period, mainly related to the small representation and publicity of the IGFS and the IGFS CB on the internet and the promotion of its activities, projects, data and products. During these early stages of the establishment of the new IGFS CB an updated webpage has been created (igfs.topo.auth.gr) as a point of information for IGFS activities.

RB continued mentioning that the IGFS work should be promoted better, making its achievements and products more visible, while the Services role, data and products should be better emphasized. A nice way of implementing that, would be through common projects under the IGFS umbrella, utilizing the products and data produced by the IGFS Services. The recent GEOMED2 project is such an example, referring to the determination of a new geoid model for the Mediterranean Sea. Within that project, data from BGI, ICGEM and IDEMS are being used, along with local gravity databases, in order to produce a marine geoid to derive the Mediterranean Sea Dynamic Ocean Topography and circulation.

A second point that needs attention is the interaction and connection with GGOS, which at the present time is problematic. The main points that need to be addressed within the coming period refer to the establishment of:

   a. Data standards
   b. Data collection standards
   c. Metadata
   d. Proper data organization
   e. Visible data storage for gravity

which may be well documented for geometric products, but are not for gravity-field related ones. An exception are the Global Earth Models (EGMs) archived by the ICGEM, which all follow the same format. To that respect all EGMs have a descriptive header with all necessary defining parameters given, while a DOI service has been added as well and it available for the latest models. Some short of standardization should be developed for the rest of the gravity products, despite the fact that especially for the historical gravity data this is very difficult if not impossible, due to the fact that the original records do not exists anymore. Even in that case, a metadata system should be developed and for each source the available information should be entered.

At that point Rene Forsberg (**RF**) comment that a single global geoid model should be proposed within the frame of GGOS as for example XEGM2016 or EGM2020. This should be based on some evaluation of the EGM to be proposed, within a group like the ones set for the evaluation of EGM2008 and GOCE-based EGMs. Moreover, the same should be done with the absolute gravity values and a proposal for a new gravity system/network.

Dan Roman (**DR**) commented on the standardization issue, that the adoption of an ISO standard should be proposed and followed. ISO19115 is the one used for the gravity products at NGA.

Roland Pail (**RP**) commented that to achieve visibility of gravity-field related products, a single entry point should be established where gravity data can be acquired. This can be set as a more visible portal/link to the IGFS page, where one can be directed to acquire data from.

Michael Sideris (**MGS**) confirmed that the major complaint for IGFS is that it is not a services, in the sense that it does not provide data and it does not have a central point where one can get data from. This should be addressed by pointing to a single source, where gravity data can be acquired. GGOS needs one common point for the acquisition of gravity data with proper metadata information on them, like the collocated measurement points for ITRF.

Hermann Drewes (**HD**) mentioned that the IGFS main page should change from its present form, in order to help people acquire data. The current structure of the webpage, showing the IGFS structure is for internal affairs. Moreover, standards and conventions for gravity related products should be set, inline with what is requested form GGOS. A standard is a different thing and entity from a convention. What we need to set first are the standards for gravity-related products and then define as well the conventions. HD proposes for a recommendation to be made, to set standards and conventions for gravity data.

Harald Schuh (**HS**) commented that GGOS was created 10 years ago and the aim was to integrate all services, both gravity and geometrical ones. This has not been done yet. For IGFS to gain visibility of its work, it is mandatory to define/develop combined products. Moreover, IGFS needs to be visible and active within GGOS and participate in the meetings. Finally, analysis workshops within IGFS, as for example IERS and ILRS, should be established, providing a more focused view of data/product dedicated analysis, e.g., gravity, EGMs, etc..

Thomas Gruber (**TG**) pointed that GGOS has products, conventions and standards. In that frame, gravity was criticized for not providing standardized products. This should be addressed. In the end, as far as EGMs are concerned, can we recommend one GGM for GGOS? Within GGOS this should be addressed and as gravity community and IGFS we should propose a single EGM. The GGOS table for standards and products should be consulted and used, especially the provided table gravity. This should be used as a guideline on the conventions missing.

For GGMs, should we set some standards for new GGM submission, so that a single person cannot submit a new model, without the backup of an institute?

RP commented on the last point that the variety of models is desirable and this should not be limited. What IGFS and ICGEM can do is to set some guidelines for a new model to be submitted, i.e., in the sense of minimal information needed for a model to be accepted and published in the ICGEM Table of Models. RP mentioned that the short-to-medium road for EGMs and IGFS is the IHRS, in the sense that a GGM should be proposed for use with the IHRS. This will be the set of convention for a GGM to be proposed to GGOS. To that respect the EGM to be used for the definition of the IHRS/IHRF should be the one proposed to GGOS. RP proposed as well the adoption of a temporal gravity service within IGFS.

George Vergos (**GSV**) mentioned that the last point has already been discussed with Adrian Jaggi (AJ) in order to include the EGSIEM temporal gravity fields as an IGFS service. This refers to the EGSIEM combination service with scientific products on temporal GGMs with a latency of 10-days. The plan is to exchange with AJ documents (description of the service, description of the uses. ToR, etc.) so that a complete proposal can be set by IGFS within the IAG EC during the EGU2017 Assembly in Vienna and a final proposal for a new IGFS service can be ready in view of the IAG2017 Scientific Assembly in Kyoto.

Sylvain Bonvalot (**SB**) proposed that gravity data bases, within projects like GEOMED, should be delivered as IGFS projects. Moreover, absolute gravity measurements within the existing collaboration between BGI and BKG should be implemented as a service for gravity time-series. Finally, it is proposed that BGI will create DOI for gravity data in order to increase their visibility and availability.

Jan Krynski (**JK**) mentioned the European Plate Observing System. The scope of the system is the integration of all observing techniques and infrastructure. GNSS integration in the project has been included, but not gravimetry. What can we do about that?

RB commented that we should get to know about that and we will do our best to include gravity as well.

Y Wang (**YW**) commented on which is the part of the scientific community and the users using the IGFS, why is it needed?

RB commented that IGFS has no products by itself and this is not its role. As per the IGFS ToR, it is mentioned that its scope is to coordinate the services under its umbrella and coordinate their efforts in product dissemination. In that sense, IGFS does not distribute products, but organizes the services under its umbrella to produce products.

Jianliang Huang (**JH**) provided one example on why the IGFS and its services coordination is needed. NRCAN recently got a request from UNB about a request they got on how to handle topography for gravity field modeling. How can we get key points and people for such questions and how can IGFS organize that? Moreover, absolute gravity stations at Canada are free. These should be linked with IGFS so that they can be made available.

HS commented at this point on the need of having as an entity IGFS. IGFS was set to be a counterpart to IERS, in the sense that gravity as a component of GGOS is needed and should exist. We need a counterpart to IERS or else GGOS itself will collapse. Therefore, IGFS should continue and its presence should be strengthened with the product availability and the availability of combined data.

At this point the IGFS meeting concluded with an adjourn and a unanimous adoption of the following Recommendations.

Recommendations for immediate action by and within IGFS

1. IGFS is to set in its main webpage a data portal so that the interested user can have direct access to data (GGMS, gravity, geoid, topo/bath, etc.)
2. IGFS will prepare a "Data Disclaimer" to be circulated, updated and agreed upon for inclusion in the services. Priority is to be put to ICGEM and ISG
3. IGFS will prepare an ISO19115 metadata form for GGMs, geoid models, gravity observations so that new measurements and models will also include this information in their description
4. A set of standards and conventions should be prepared by ICGEM in cooperation IGFS for the minimal parameters needed in order to describe properly and submit to ICGEM a new Earth Geopotential Model
5. IGFS will prepare a how-to guide for relative gravity data acquisition and metadata documentation
6. IGFS will review and prepare a set of standards and subsequently a set of conventions, based on the standards and conventions by GGOS, referring to gravity data
7. IGFS will cooperate with the EGSIEM consortium to investigate the possibility of including the temporal (60-day) combined gravity fields as an IGFS service. Until EGU2017 (April 2017) a preliminary ToR will be generated to be discussed in the IAG EC scheduled and the final decision will be prepared to be presented during the next IAG Assembly in Kyoto (August 2017)
8. IGFS will coordinate the work between BGI and BKG in order to develop an absolute gravity data service to provide gravity time-series
9. IGFS will cooperate with the GGOS Focus Area 1 and the JWG on the IHRS realization for the inclusion of the IHRS/IHRF as an IGFS product.

List of participants:

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