

# NEWSLETTER #21

2011 Melbourne

2013 Warsaw



7 June 2013

---

Part 1. GGP Business Meeting at the IUGG in Melbourne, Australia, July 2011. ....	2
1. GGP as IFAGS service.....	2
2. Next Earth Tides Symposium – Call for Sessions.....	3
3. Special Issue on Terrestrial Gravimetry .....	3
4. GWR Website.....	3
5. Recent Publications.....	3
Part 2. GGP Business Meeting, Earth Tides Symposium, Warsaw, Poland, Monday April 15, 2013. ....	4
1. Those in attendance:.....	4
2. The Current Situation (Crossley/Hinderer).....	5
3. Station Review (All) .....	5
4. State of the GGP/ISDC database in Potsdam (Crossley/Hinderer/GFZ personnel).....	8
5. State of the GGP/ICET database in Tahiti (Barriot/Ducarme) .....	8
6. Results of the GGP Status Survey (Crossley) .....	8
7. The Future - Proposals and Solutions (Open) .....	8
8. Next Meeting .....	9
9. Adjournment .....	9
Part 3. ETS2013 Resolutions.....	10
Part 4. GGP-ICET Teams .....	12

---

Prepared by David Crossley and Jacques Hinderer, following the IUGG, July 5, 2011, and the ETS June 7, 2013.

## Note

There are two attachments included with this Newsletter in the format of Powerpoint Presentations:

1. Station Reports from the Warsaw 2013 Meeting ([GGP station report.pdf](#))
2. Reports from the ICET/GFZ data centres at Tahiti and Potsdam, and analysis of the GGP Survey conducted prior to the Warsaw Meeting ([GGP data center and survey.pdf](#))

*[Hint: to open a linked file in separate window, hold down the <Ctrl> key while clicking the hyperlink]*

# Part 1. GGP Business Meeting at the IUGG in Melbourne, Australia, July 2011.

## 1. GGP as IFAGS service

The following is a summary of the proposal submitted by GGP to the IAG during the last IUGG Meeting in Melbourne. The proposal was approved at a special meeting of the IAG executive in Melbourne. These are the terms under which GGP is currently operating.

1. Inter-Commission Project 3.1 (GGP) was part of IAG Commissions 2 and 3 until June 2011. Under IAG rules, GGP then completed its period of 8 years of activity (starting at the IUGG Sapporo, 2003).
2. The choices were (a) a Study Group, (b) a Working Group, or (c) to migrate to the role of an IGFS service (parallel to ICET).
3. GGP (members present at the IUGG), in discussions with IAG representatives, strongly supported option (c), as indicated in prior GGP Business Meetings and Newsletters.
4. GGP will work out the details of how the new GGP operations are to be structured prior to the Earth Tides Symposium in Egypt.
5. It is intended that the new service will provide the following products:
  - a. Uncorrected 1 minute data from each station, uploaded no later than 3 months after collection, and then available immediately to the community. This may *tentatively be called Level 1 data*, and is identical to current GGP data sent to ICET/GFZ.
  - b. Long term time series from each SG station, processed with a standard package of corrections, in the same manner as GRACE data. These corrections will be for data gaps, spikes, offsets, and disturbances, *in which the offset determinations will be verified jointly with individual stations*. Then there follows corrections for tides, atmosphere, polar motion, non-tidal ocean loading, and SG drift using AG data; *perhaps in analogy with GRACE this is Level 3 data*. Intermediate steps and processing options may be available for user choice at the various steps, *and this would be consistent with Level 2 data*.
6. Implementation of this service will require major changes to the current operations, such termination of the present arrangement with ICET (correction of 1 min data, which henceforth will be done by the individual stations) and a migration of the current ICET/GFZ database to an institution familiar with AG and SG instruments and data processing. This could, for example, involve an arrangement between IPG Strasbourg and BKG Frankfurt.
7. During this 1 year period GGP will develop the structure of the service (Steering Committee, Appropriate Name, Terms of Reference, etc.) and work with both the SG and AG communities on how to construct the second product (long term residual gravity at each station). This last step to remove SG instrument drift will require active cooperation between the various SG and AG groups, and the AG data required will be integrated into the new service.
8. At the end of the 1-year trial period in Cairo, Egypt, GGP will present the structure and a working version of the new database, populated with sample products (e.g. the residual

gravity 1997-2011 at participating European stations) and request approval to form the IGFS Service.

9. GGP thanks (the previous) Commission 2 and Commission 3 representatives (notably Veronique Dehant, Richard Gross, and Yoichi Fukuda), and Harald Schuh from IAG, for supporting our activities over the past 8 years.

We hope this step will ensure the future of GGP as a global network, and yield a product that will be useful to IGFS, GGOS, IAG, and other scientists.

David Crossley and Jacques Hinderer, Melbourne IUGG, July 5, 2011.

## ***2. Next Earth Tides Symposium – Call for Sessions***

At the time of the Melbourne IUGG, the expectation was that the next ET Symposium was to take place in Cairo, Egypt in 2012. This proved to be not possible, and the location was changed to Warsaw in April 2013. The symposium of course has already taken place, and further details are given below.

## ***3. Special Issue on Terrestrial Gravimetry***

There was to be a Special Issue on "Present Day Challenges for High-Precision Terrestrial Gravimetry Applied to Geodynamics," to be published in the International Journal of Geophysics in July 2012. Unfortunately, the Journal did not receive enough abstracts, and so the issue was cancelled. The contact person was Nada Qassem, Editorial Office, International Journal of Geophysics, Hindawi Publishing Corporation, <http://www.hindawi.com/journals/ijgp/>

## ***4. GWR Website***

The GWR website has been updated and improved. A significant feature is the inclusion of links to research publications. Here is the link:

<http://www.gwrinstruments.com/gravimeter-applications.html>

## ***5. Recent Publications***

Ducarme B., 2012. Determination of the main Lunar waves generated by the third degree tidal potential and validity of the corresponding body tides models, *J. Geodesy*, 86, 1, 65-75.

DOI: 10.1007/s00190-011-0492-9. This paper is available electronically on SpringerLink:

[http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1007/s00190-011-0492-](http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1007/s00190-011-0492-9)

9

## **Part 2. GGP Business Meeting, Earth Tides Symposium, Warsaw, Poland, Monday April 15, 2013.**

### ***1. Those in attendance:***

David Crossley Saint Louis University USA [crossley@eas.slu.edu](mailto:crossley@eas.slu.edu)  
Jacques Hinderer IPGS/EOST Strasbourg France [jhinderer@unistra.fr](mailto:jhinderer@unistra.fr)  
S everine Rosat IPGS/EOST Strasbourg France [srosat@unistra.fr](mailto:srosat@unistra.fr)  
Jean-Paul Boy IPGS/EOST Strasbourg France [jeanpaul.boy@unistra.fr](mailto:jeanpaul.boy@unistra.fr)  
Spiros Pagiatakis York University [spiros@yorku.ca](mailto:spiros@yorku.ca)  
Alexander Brzezinski SRC Warsaw Poland [alek@cbk.waw.pl](mailto:alek@cbk.waw.pl)  
Jolanta Nastula SRC Warsaw Poland [nastula@cbk.waw.pl](mailto:nastula@cbk.waw.pl)  
Ove Omang Kartverket Norway [ove.omang@statkart.no](mailto:ove.omang@statkart.no)  
Walter Zuern BFO Germany [walter.zuern@partner.kit.edu](mailto:walter.zuern@partner.kit.edu)  
Nicolas le Moigne G eosciences Montpellier France [nicolas.lemoigne@univ-montp2.fr](mailto:nicolas.lemoigne@univ-montp2.fr)  
C edric Champollion G eosciences Montpellier France [cedric.Champollion@univ-montp2.fr](mailto:cedric.Champollion@univ-montp2.fr)  
Peter Schindler Univ. Jena Germany [peter.schindler@uni-jena.de](mailto:peter.schindler@uni-jena.de)  
Thomas Jahr Univ. Jena Germany [thomas.jahr@uni-jena.de](mailto:thomas.jahr@uni-jena.de)  
Umberto Riccardi DISTAR University of Naples Italy [umbrica@unina.it](mailto:umbrica@unina.it)  
Michel van Ruymbeke ROB Belgium [labvrui@oma.be](mailto:labvrui@oma.be)  
Hana Krasna TU Vienna Austria [hana.krasna@tuwien.ac.at](mailto:hana.krasna@tuwien.ac.at)  
Xiaoming Cui Institute of Geodesy and Geophysics Wuhan China  
Xiandong Chen Institute of Geodesy and Geophysics Wuhan China [chenxd@whigg.ca.cn](mailto:chenxd@whigg.ca.cn)  
Hu Xiao Gang Institute of Geodesy and Geophysics Wuhan China  
Jean-Pierre Barriot University of French Polynesia [jean-pierre.barriot@upf.pf](mailto:jean-pierre.barriot@upf.pf)  
Heiki Virtanen Finnish Geodetic Institute Finland [heiki.virtanen@fgi.fi](mailto:heiki.virtanen@fgi.fi)  
Hannu Ruotsalainen Finnish Geodetic Institute Finland [Hannu.Ruotsalainen@fgi.fi](mailto:Hannu.Ruotsalainen@fgi.fi)  
Beatriz Cordoba IGN Spain [b.cordoba@oan.es](mailto:b.cordoba@oan.es)  
Marta Calvo IGN Spain [mcalvo@fomento.es](mailto:mcalvo@fomento.es)  
Jeff Kennedy USGS USA [jkennedy@usgs.gov](mailto:jkennedy@usgs.gov)  
Janusz Bogusz MUT Poland [jbogusz@wat.edu.pl](mailto:jbogusz@wat.edu.pl)  
Bernard Ducarme Universit  Catholique de Louvain La Neuve Belgique [bf.ducarme@gmail.com](mailto:bf.ducarme@gmail.com)  
Shaocong Luo WHIGG CAS China [luosc@whigg.ac.cn](mailto:luosc@whigg.ac.cn)  
Heping Sun WHIGG CAS China [heping@whigg.ac.cn](mailto:heping@whigg.ac.cn)  
Houtse Hsu WHIGG CAS China [hsuh@whigg.ac.cn](mailto:hsuh@whigg.ac.cn)  
Jiangcun Zhou WHIGG CAS China [zjc@asch.whigg.ac.cn](mailto:zjc@asch.whigg.ac.cn)  
Herbert Wilmes BKG Frankfurt Germany [Herbert.wilmes@bkg.bund.de](mailto:Herbert.wilmes@bkg.bund.de)  
Hartmut Wziontek Frankfurt Germany [Hartmut.Wziontek@bkg.bund.de](mailto:Hartmut.Wziontek@bkg.bund.de)  
Andreas Guentner GFZ Potsdam [guentner@gfz-potsdam.de](mailto:guentner@gfz-potsdam.de)  
Bernd Ritschel GFZ Potsdam Germany [rit@gfz-potsdam.de](mailto:rit@gfz-potsdam.de)  
Christoph Foerste GFZ Potsdam Germany [foer@gfz-potsdam.de](mailto:foer@gfz-potsdam.de)  
Harald Schuh GFZ Potsdam Germany [schuh@gfz-potsdam.de](mailto:schuh@gfz-potsdam.de)  
Bruno Meurers University of Vienna Austria [Bruno.meurers@univie.ac.at](mailto:Bruno.meurers@univie.ac.at)

## ***2. The Current Situation (Crossley/Hinderer)***

The meeting started at 4 15 PM. DC welcomes all participants and introduces the agenda and commented on the GGP station survey that was sent out before the ETS meeting to the GGP participants. There were many positive answers to key questions about the willingness of scientists to continue with GGP using existing stations and new ones.

## ***3. Station Review (All)***

SG leaders were invited to present a short report on the status of their stations; verbal, or with a few slides.

Hereafter is the list of the stations for which there are recent news or for which a report was available. Stations in bold indicate that authors attended the meeting and presented their own reports. Some reports were submitted electronically and were conveyed by D. Crossley. Other reports are included in the file [GGP station report.pdf](#).

- **Apache Point USA ; D. Crossley.** SG 046 is back at GWR to fix a failure of the data acquisition system and to rebuild sensor to correct the large positive large drift. A return is expected sometime this summer. The long gap will be anchored by AG measurements.
- **BFO Germany; W. Zuern**
  - SG-056 is operational; it has 2 different spheres (UG1: heavy sphere, and UG2: standard sphere). There is no tilt compensation but there are 2 existing pressure signals (outside and inside a lock in the mine)
  - two data acquisitions are connected to SG: DVM/UIPC and Q330HR.
  - 1-min data from DVMs shipped to ISDC on monthly basis.
  - 1-Hz data shipped in in real time to IRIS/DMC (near real time)
  - SG data: network code: II, station: BFO, channels: LG1, LG2; loc. code: 00;
  - Barometer data: II-BFO-LDO-10
  - First coldhead replacement in January 2013 after 3.25 years of operation.
  - No measurable He loss during regular operation (less than 1% in 3.25 years).
  - Four calibration campaigns with FG-5s since start of operation (Sept. 2009):
  - Drift now stable at -2 uGal/year (UG1: heavy sphere) and -13 uGal/year (UG2: standard sphere).
  - Coming soon: experiments to determine frequency dependent transfer function.
- **Bad Homburg Germany, Wetzell Germany, Medicina Italy, Conception Chile, BKG; H. Wilmes, see separate document**
- **BO Boulder USA.** The instrument had a catastrophic failure and was delivered to the manufacture GWR for repair and service. Mark Eckl (NOAA) now reports that the BO SG has been fixed and is operational. Data will flow to GGP in the near future.
- **CA Cantley Canada, from J. Henton.**
  - The operation and maintenance of the CA gravimeter has changed to the following personnel:
    - Joe Henton- Research Scientist
    - Goran Pavlic- Data Processing

- Stuart Elson- Operation and Maintenance
  - Equipment Updates since 2008:
    - New 7 digit voltmeter installed February 2011.
    - Last calibration performed January 2012, through National Research Council- Institute for National Measurement Standards
    - Digital Pressure Transducers:
  - Last calibrations performed March 2012 through National Research Council- Institute for National Measurement Standards
  - We are always open to discussions by the GGP community regarding the operation of the CA gravimeter.
- CI Cibinong Indonesia (report of information from Y. Fukuda Kyoto). It would be rather difficult to recover the old SG (CT#22), but colleagues in Cibinong (BIG: Badan Informasi Geospasial, former BAKOSURTANAL) are making every efforts to obtain a new SG (OSG or iGrav) for future contribution to GGP. Therefore supports of GGP to restart the SG observation in Cibinong would be really appreciated.
- **Conrad Observatory, Austria; B. Meurers**
  - GWR C025 is operating at Conrad observatory since 20071109 without interrupt. Several calibration experiments (involving FG5 and JILA-g absolute gravimeter and a Scintrex CG-5) permit now providing a scale factor with accuracy better than 0.1%. The calibration results indicate that the scale factor did not change due to the transfer of the SG from VI to CO in autumn 2007. This is also confirmed by tidal analysis results of the VI and CO gravity time series. The new scale factor is based on all AG-SG inter-comparisons performed since 2005 and holds also for the Vienna gravity time series (<http://www.hindawi.com/journals/ijgp/2012/954271/>).
  - Calibration experiments are planned twice a year. Consequently, the scale factor obtained by averaging over all experiments is expected to change slightly in future. This holds generally true for all GGP stations. It is highly recommended to establish a calibration data file for each station in the GGP data base which provides the calibration history and the most reliable number currently available. The scale factor currently visible in the header of the data files should be cancelled. Otherwise, once uploaded together with the time series, potentially wrong information on the scale factor would be extracted by users of the GGP data base.
  - GWR C025 is an “old-fashioned” compact SG. Evaporating He gas probably causes He concentration in the SG chamber such that it deteriorates the stability of the AG atomic clock. Unfortunately, this problem got apparent very late. Therefore only a few absolute gravity observations can be utilized for the SG drift determination while the calibration experiments are not affected by this failure. This hampers providing an accurate SG drift function at present.
- Hsinshu Taiwan, from C. Hwang. 2 SGs are operational; local offer to provide ocean loading and station hydrology for other SG sites. The dewar of OSG048 of HS had shown some problems since the spring of 2012 (helium leakage is speculated), so the instrument was shut down in December 2012, in preparation for overhaul at GWR in 2013.

- The new station at the volcano site, Mt. Yangming, (short name: YM ) has been operating for almost one year; the condition is good. The data has (collected by OSG049) not been released to the public so far, but is possible be shared with other members in the future (as a new GGP station). Ben Chao is a collaborator and very interested in sharing the data.
- **Larzac France; C. Champollion**, *see separate document*
- **Metsahovi Finland; H. Virtanen**, *see separate document*
- **Moxa Germany; T. Jahr**, *see separate document*
- **Strasbourg France / Djougou Benin; J. Hinderer**, *see separate document*
- **Ny-Aleseund Norway; O. Omang**, *see separate document*
- **Onsala Sweden**, from H.-G. Scherneck
  - Since June 16, 2009, we've had data loss at a few (<10) ppm No jumps.
  - So far one initial exponent suffices for the drift. Persistent linear drift is estimated at -12.8 uGal/yr.
  - Calibration factor is based on parallel AG campaigns, the most extensive in 2011 (14,600 drops), precision 0.166%.
  - Barometric effect: -0.3286 uGal/hPa, +0.009 contributed from Kattegat basin, coast at a few hundred meters distance.
  - Onsala space observatory monitors weather data. OS AUX files specify at the moment Rain rate and Rain-last-1-hour, more columns can be copied over – ask me.
  - We also measure monument temperature at four points and monument height comparing the length of a 4-m invar rod mounted in the bedrock. This data can be added to the AUX files – ask me.
  - OS is on crystalline bedrock, no real groundwater problem. We do have a 10 m deep borehole at 2 m distance from the monument, but the sensor is not installed yet.
  - For much of 2010 and 2011 we have parallel broadband seismograph records (owner: SNSN at Uppsala University, <http://snsn.se>) at 3 m distance from the SG monument. After relocation of the seismograph in Sep. 2012, the distance is now 530 m.
  - We run a live page at <http://holt.oso.chalmers.se/hgs/SCG/monitor-plot.html> with 1 minute latency.
  - Plans:
    - Quanterra Q330HR to be hooked up to SG electronics before anti-alias filter. In progress.
    - Borehole groundwater sensor, little progress expected.
- **Pecny Czech Republic; V. Palinkas**, *see separate document*
- **Sidney Canada**, new station, from J.W. Kim After 10 months measurement, there was high frequency noise in iGrav of SI. We contacted with GWR and tried to fix the problem. It needs time to experiment on decreasing the noise. We are trying to reduce the pressure of compressor from 1.9 to 1.7 MPa.
- **Sutherland, South Africa; C. Förste**
- **Syowa Japan**, from K. Shibuya. SG (OSG#058) in Syowa Station is operating in a good condition without any observation interruptions for more than three years.

- The cryocooler was exchanged in February, 2012 for the maintenance after its two years operation. Condition of the cryocooler is also good and the liquid helium level is being kept at around 95% with very few gas helium consumption.
- We can't find any apparent instrumental drift in the residual gravity time series after removals of earth tide signals and effects of atmospheric pressure changes and polar motion.
- **Yebes Spain; B. Cordoba**, *see separate document*
- **China SGs (Wuhan Lhasa, third site); H.-P. Sun**, *see separate document*

DC indicates that we have no news from the two stations in India but we know that there were recent changes of personnel in charge of these stations.

#### ***4. State of the GGP/ISDC database in Potsdam (Crossley/Hinderer/GFZ personnel)***

A short presentation on the present status of the GGP data base at GFZ in Potsdam was given by C. Foerste (see file [GGP data center and survey.pdf](#)). B. Ritschel and colleagues at GFZ also gave a presentation: "New concepts for Semantic Web standards based geoscience data and information management -What could the future GGP service look like?".

#### ***5. State of the GGP/ICET database in Tahiti (Barriot/Ducarme)***

The report of the activity of ICET in the processing of the GGP data since IUGG meeting in 2011 was presented by J.-P. Barriot. The document is available in *GGP data center state and survey* file. The problem of the format of the GGP data (presently text files) is raised and there is a proposal by J.-P. Barriot to move to the XML format (Gabillon et al. Advance Publication, Data Science Journal, 10 April 2013). See file [GGP data center and survey.pdf](#)

#### ***6. Results of the GGP Status Survey (Crossley)***

Following the IUGG in Melbourne (reported above), a survey was distributed prior to the ETS2013 to all GGP members, as shown by D. Crossley. Questions and answers are given in the file [GGP data center and survey.pdf](#). In summary, there is a very clear positive attitude of the community to further extend the project (GGP) in the future and willingness to share SG data in the framework of a new IGFS Service.

#### ***7. The Future - Proposals and Solutions (Open)***

- a) the IAG perspective (*Schuh*)
- b) location and processing of SG data
  - IPG-EOST Strasbourg (*Hinderer/Boy*)
  - ISDC Potsdam (*GFZ personnel*)
  - connections with BKG/AG database (*Wilmes*)
  - connections with IRIS/EarthCube (*Crossley*)
- c) Open discussion



The perspective of moving GGP toward a Service of the IAG (Int. Assoc. Geodesy) was presented by H. Schuh as vice-president of IAG. He confirmed that it is the right time now to move into this direction. GGP has to create the momentum to propose something coherent to IAG and this should be done in the near future with a draft proposal ready for the next general Assembly of IAG in Potsdam in September 2013. H. Schuh commented on such a service by saying it is more than just a data base but also includes technology support, progress in education and training, and so on. He suggested to check with the existing IGS or IVS services. He pointed out that a directing board of this new service is needed with elected people from several countries. He strongly encouraged the evolution of GGP-ICET toward this new service on a voluntary basis arguing that similar initiatives in the past were very successful. Such a service can have various components such as a data center (upload and download), different processing centers, a place with processing tools, bibliography and tutorials.

A discussion on this possible IAG service took place with various aspects: role of ICET and the use of the GGP data corrected for tidal analysis, the need for more levels in the processing (tidal corrections, loading corrections, drift estimate using AG data, calibration), existence of metadata (changes in scale factor, step history, log files, ...)

DC stops this long discussion and suggests that the status of GGP evolves to a transition from project to service: second act of GGP to begin! He favors an initiative that will assemble groups with different tasks in a working group in order to write up a document with terms of reference to be submitted to IGFS (Int. Gravity Field Service). DC proposes to send very quickly an e-mail to GGP community for agreement.

## ***8. Next Meeting***

The GGP-ICET Proposal for a new IGFS service will be presented at the IAG Assembly in Potsdam. Details follow here from the latest IAG Newsletter:

### ***IAG Scientific Assembly 2013***

Online registration is now possible via the link on the webpage [http://www.iag2013.org/IAG\\_2013/Registr.html](http://www.iag2013.org/IAG_2013/Registr.html). Deadline for Early Bird registration is **June 26, 2013**. The online registration will be closed on 28 August 2013, 23:59 h. After that, only on-site registration in Potsdam and the (more expensive) on-site payment will be possible. Themes as well as detailed description of themes of the IAG Scientific Assembly 2013 are available from the webpage [http://www.iag2013.org/IAG\\_2013/Themes.html](http://www.iag2013.org/IAG_2013/Themes.html). For further conference information, please visit our homepage <http://www.iag2013.org>.

The IAG Committees would like to thank cordially all authors for their scientific contributions. Nearly 500 abstracts were received. Notifications of acceptance will be sent to all authors per e-mail at the end of May. All abstracts accepted and presented at the Assembly (oral or poster) may be submitted as papers for publication in the peer-reviewed IAG Symposia Series at Springer Publisher within one month after the Assembly.

IAG 2013 will offer you an interesting and comprehensive scientific program together with a variety of unique cultural events.

IAG 2013 LOC

## ***9. Adjournment***

Thanks were expressed to Janusz Bogusz and his LOC for organizing ETS2013 in Warsaw. The Business Meeting meeting concluded at 19:00.

## **Part 3. ETS2013 Resolutions**

IAG Commission 3 is Earth Rotation and Geodynamics, current president Richard Gross, and Vice President Alexander Brzezinski. We are grateful to Spiros Pagiatakis, Chair of Sub-Commission SC 3.1, for providing the Symposium Resolutions for inclusion in this Newsletter.

# **RESOLUTIONS**

## **17 International Symposium on Earth Tides**

**15-19 April, 2013**

**Warsaw, Poland**

### **Resolution 1**

- 1) The participants of the 17<sup>th</sup> International Symposium on Earth Tides taking into consideration
  - a. the Terms of Reference and Objectives of the IAG SC-3.1
  - b. the increased activities in multidisciplinary research in geodynamics, and
  - c. the widening frequency band and extension of spatial scales of the geodynamic phenomena that can be captured by a large variety of sensors and observing systems,

Recommend that

- a. the name of the SC-3.1 be changed to “Geodynamics and Earth Tides” to better reflect the nature of the research activities,
- b. the name of the “International Symposium on Earth Tides” be changed accordingly to “International Symposium on Geodynamics and Earth Tides”,
- c. the international symposia under the new name be numbered consecutively from the previous conferences to ensure continuation,
- d. the above changes be effective after the next IUGG General Assembly in 2015, in compliance with the IAG status and bylaws.

### **Resolution 2**

- 2) The participants of the 17<sup>th</sup> International Symposium on Earth Tides recognizing
  - a. the significant and continued contribution of GGP to geodynamics research,
  - b. the increased demand for GGP data and relevant products for multidisciplinary research, engineering and operational applications and experimentation,
  - c. the increased demand for data and relevant products observed by a wide range of sensors including, but not limited to, tilt meters, strain-meters, and spring gravimeters, for multidisciplinary research, engineering and operational applications and experimentation, and
  - d. the need to provide the users with the above data and data products in complete, uniform, authoritative and timely fashion

Recommend that

- a. a new IAG Service be created under the umbrella of IGFS,
- b. the new service be named “GGP- ICET Service”,

- c. the new service include two components namely “Global Geodynamics Project - GGP” and “International Centre of Earth Tides - ICET”.

Furthermore, they recommend that

- d. a working group be formed immediately to carry out a thorough analysis of the needs of, and prepare a proposal for the creation of the new service, its terms of reference, goals and objectives and structure,
- e. ICET continue to operate as usual, provide support to GGP, make available to the end-user a track of all corrections applied to the GGP data, and publish BIM.

### **Resolution 3**

- 3) The participants of the 17<sup>th</sup> International Symposium on Earth Tides recognizing the importance of dissemination of the scientific contributions of the symposium recommend that
  - a. a number of manuscripts be submitted to the Journal of Geodynamics for publication for a future Special Edition (SI).
  - b. Papers with technical and/or instrumentation development and calibration content will be published in BIM.

### **Resolution 4**

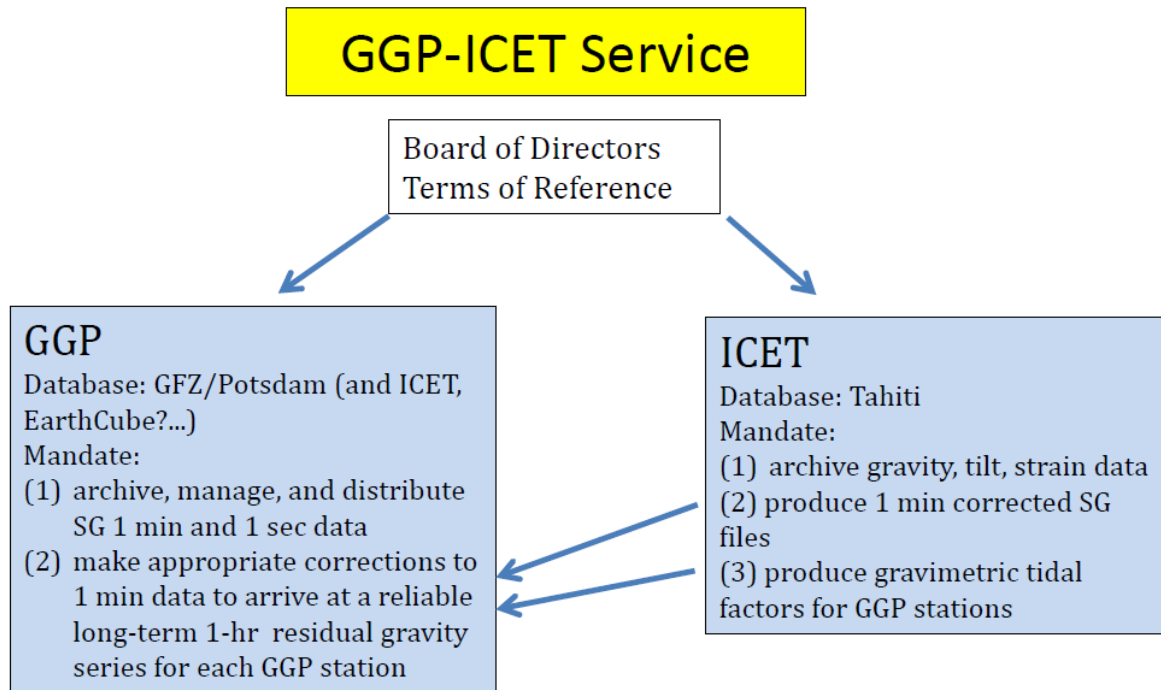
- 4) The delegates of the 17<sup>th</sup> International Symposium on Earth Tides accept the proposal by Prof. Carla Braitenberg to hold the 18<sup>th</sup> International Symposium on Earth Tides in Trieste, Italy, in 2016.

### **Resolution 5**

- 5) The participants of the 17<sup>th</sup> International Symposium on Earth Tides, the IAG Commission 3, the IAG Sub-commission 3.1 and the Global Geodynamics Project thank the Military University of Technology (MUT), and the sponsors of the symposium, namely the International Association of Geodesy, the Rector of MUT and the Committee for Geodesy, Polish Academy of Sciences for hosting and supporting this event. Moreover, the delegates thank the Local Organising Committee (LOC), Janusz Bogusz (Head of LOC), Marcin Gałuszkiewicz, Andrzej Araszkiewicz, Katarzyna Kamińska, Anna Kłos, Lidia Rachoń and Karolina Szafranek for their warm welcome and flawless organisation that made the 17th International Symposium on Earth Tides a great scientific success.

## Part 4. GGP-ICET Teams

For the purpose of implementing Resolution 2, above, GGP and ICET are collaborating in a number of teams, working over the summer of 2013 to prepare a proposal to be presented at the IAG Scientific Assembly in September 2013, Potsdam.



*Comment: GGP and ICET will merge into one service with one BoD, and one ToR, but maintain different mandates. ICET will continue its traditional role and send 2 products to GGP. GGP will expand its service to provide a 1-hr corrected series for each GGP station.*

The structure and tasks of the teams are as follows, and team leaders have agreed to their tasks. Note that team cooperation is fluid, and input is welcomed from any SG group on any of the topics.

### Team Leaders

David Crossley	<a href="mailto:crossley@eas.slu.edu">crossley@eas.slu.edu</a>
Bernard Ducarme	<a href="mailto:bf.ducarme@gmail.com">bf.ducarme@gmail.com</a>
Jean-Paul Boy	<a href="mailto:jeanpaul.boy@unistra.fr">jeanpaul.boy@unistra.fr</a>
Christoph Förste	<a href="mailto:foer@gfz-potsdam.de">foer@gfz-potsdam.de</a>
Hartmut Wzionteck	<a href="mailto:hartmut.wziontek@bkg.bund.de">hartmut.wziontek@bkg.bund.de</a>
Vojtech Palinkas	<a href="mailto:vojtech.palinkas@pecny.cz">vojtech.palinkas@pecny.cz</a>

## GGP-ICET Interim Teams

1. Management Team: **Crossley**, Hinderer, Pagiatakis – formulate Terms of Reference, Coordinate planning efforts with Harald Schuh
2. ICET Team: **Barriot**, Ducarme, ... - revisit the 1 min corrected data (units of volt, correcting function,) and add gravimetric factors
3. Loading Team: **Boy**, Wziontek, ... - formulate standard correction for tides (solid + OTL), global atmosphere + mass attraction, global hydrology, polar motion,
4. Database Team: **Forste**, Ritschel, Barriot, Wziontek, EarthCube .... – Fix minor problems with existing database, formulate modern interface for the Service, following Ritschel's ETS2013 talk + XML?....
5. SG Trend Team: **Wziontek**, Wilmes, Meurers, ... - use AG data to remove best linear (?) trend from SG data, manage offsets and calibration factors
6. Raw Data Team: **Palinkas**, Rosat, Forbriger, M.V. Camp ... - organize collection of 1 sec data from stations, conversion to IRIS miniseed format and system transfer function, provision of noise spectra (method of VP) ...

## Proposal to IAG/IGFS

The 6 teams will coordinate efforts during August to arrive at a recommended standard processing procedure.

This procedure will be applied to a number of stations (e.g. Strasbourg, Wettzell, BFO ....) to produce a long-term 1 hr series.

The procedures and results will be circulated to all Station Managers for comments

The package to be presented to the IAG in September by a GGP rep (J.P. Boy, H. Wilmes ...)