

EGSIEM General Meeting

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| Date(s) of Meeting: | 18./19. January 2016 | Location: | Salle des Conseils University of Luxembourg |
| Minutes Taken by: | K. Cann-Guthauser | Doc ID: | General_Assembly_Minutes_Jan2016 |

Distribution List

| EGSIEM Management | EGSIEM Consortium Members | Others |
|---------------------------------|---------------------------|--------------------------------|
| A. Jäggi / UBERN (AJ) | U. Meyer / UBERN (UM) | R. Gross / JPL (RG) |
| F. Flechtner / GFZ (FF) | A. Sušnik / UBERN (AS) | J. Kusche / U Bonn (JK) |
| A. Güntner / GFZ (AG) | Y. Jean / UBERN (YJ) | J. Skøien / EC JRC (JS) |
| T. Mayer-Gürr / TUG (TMG) | J.M. Lemoine / CNES (JML) | H. Steffen / Lantmäteriet (HS) |
| J. Flury / LUH (JF) | R. Biancale / CNES (RB) | T. Gruber / TU München (TG) |
| T. van Dam / UL (TvD) | H. Zwenzner / DLR (HZ) | M. Blossfeld / TU München (MB) |
| K. Cann-Guthauser / UBERN (KCG) | S. Martinis / DLR (SM) | P. Ditmar / TU Delft (PD) |
| | S. Bourgogne / G&C (SB) | J. Encarnacao / TU Delft (JE) |
| | T. Bandikova / LUH (TB) | M. Weigelt / BKG (MW) |
| | C. Gruber / GFZ (CG) | S. Bettadpur / CSR |
| | B. Gouweleeuw / GFZ (BG) | <i>F. Berthoud / EC REA</i> |
| | Z. Li / UL (ZL) | <i>M. Koleva / EC REA</i> |
| | Q. Chen / UL (QC) | |
| | B. Klinger / TUG (BK) | |
| | A. Kvas / TUG (AK) | |
| | L. Poropat / GFZ (LP) | |

List of Annexes: Presentations by members of EGSIEM and others

- Annex01_Welcome
- Annex02_WP1_Management
- Annex03_WP2_Processing_Improvements
- Annex04_WP2_EGSIEM
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- Annex07_WP3_Validation_with_GNSS_loading
- Annex08_WP3_GRACE_Validation_with_OBP
- Annex09_WP3_GIA_Correction_for_Hydrology
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- Annex27_Publication_Plan

| Agenda Item Nr. | EGSIEM General Meeting, 18.& 19. January 2016 | Action Item |
|-----------------|--|---|
| 1 | Welcome and purpose of Meeting [Jäggi & van Dam] | |
| | <p><i>Annex01: Welcome (AJ)</i></p> <p>AJ welcomed all (incl. Associate and Advisory Board members) to the General Meeting. TvD added her own welcome and gave logistical info on the room and arrangements for the evening meal.</p> <p>To begin, AJ reminded the consortium of the next upcoming project Deliverables, the first of which (D7.2 EGSIEM Brochure) has already been completed in October 2015 (M10):</p> <ul style="list-style-type: none"> • EGSIEM Brochure (M14) • Teaser Lecture (M15) • GRACE/GRACE-FO Product Report (M18) • Concept of Scientific Service (M18) <p>As the last Milestone (2 <i>Implementation and Preparation Review</i>) is still open, the due date was November 2015, we will aim to close it by end of February (so as to be able to report on it at the Review Meeting at the beginning of March, see below). AJ expanded on the Tasks necessary to achieve the milestone, CNES to provide feedback on T2.2, GFZ & LUH to give the status of T2.3</p> <p><u>Action Item Status review</u></p> <p>AJ reported that the Action Item on Publication Plan ideas is still outstanding for some groups (see the end of this document), therefore the deadline has been amended. Otherwise, the following Action Items are still outstanding:</p> <p>AI#011 – awaiting feedback from CNES</p> <p>AI#012 – awaiting feedback from CNES</p> <p>AI#013 - GFZ to provide software for Arctic/Greenland by summer</p> <p>AI#014 – awaiting feedback from CNES</p> | <p>AI#016</p> <p>AI#006</p> |

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| | AI#015 – awaiting feedback from UL and G&C | |
| 2 | Administrative Overview (KCG) | |
| | <p><i>Annex 02: WP1_Management (KCG)</i></p> <p>KCG provided information on a recent request originating from the EC to amend the administrative content of the standard Grant Agreement, and also gave advice on completing the financial sections of the Participant Portal.</p> | |
| 3 | WP2 Gravity Field Analysis (TMG) | |
| | <p><i>Annex 03: WP2_Processing_Improvements (UM)</i></p> <p>UM updated the consortium on developments at AIUB. TUG provided star camera plus angular accelerations sensor fusion data that have a significant impact on the geometric K Band correction UM said that there was little impact on the gravity field solutions at this stage of testing. Similar impact could be achieved by low pass filtering of the original Geometric K Band correction provided in the L1B K Band datafiles.</p> <p><i>Annex04: EGSiem_WP2</i></p> <p><i>All the following presentations can be found within Annex04</i></p> <p><u>T2.2 GFZ Processing Tools (FF)</u></p> <p>GFZ has been testing the FES2014 model from CNES/GRGS, improvements have been found in Polar Regions (up to 2-3 cms). FES2014 shows no significant impact in terms of global wRMS. GFZ is happy to adopt FES2014. GFZ tested Sensor Fusion Data but GFZ report (based on only one test month of data) that it shows no significant impact on gravity field solutions.</p> <p><u>TUG Processing (BK)</u></p> <p>Since the last project meeting TUG have been making improvements to their solution, for instance Yaw turns have been removed from the data. Comparison of signals was completed for TUG reprocessed data compared to ITSG2014 & CSR RL05.</p> <p><u>CNES/GRGS Processing (JML)</u></p> <p>Hydroweb website is now available at hydroweb.theia-land.fr Please note that prior registration is required.</p> <p>FES2014 shows a reduction in residuals (compared to 2012) biggest improvement shown in Arctic ocean. KBR weighting better at degree 40, higher than 40 gives striping and adds artifacts to readings at the poles.</p> <p>Clarification was sought over what data was used, CNES are also testing with SLR data.</p> <p>JML- Are TUG using Encke's method? TMG-Yes, using an elliptical orbit as reference to improve the numerics of integration</p> <p>TG asked whether any conclusions could be drawn from all the different approaches – TMG responded by saying that no universal approach was intended.</p> <p><u>T2.3 GRACE reprocessing (TMG)</u></p> <p>TMG proposes all ACs compute and provide monthly mean of all background models adopted. TG queried the use of tide data, TMG answered that tides are also mass transport signals which can be investigated by GRACE gravity field solutions.</p> <p>Before opening the discussion on reprocessing data TMG made the case for working on</p> | |

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| | <p>Level 2 data. TMG argues that there is no compelling reason why EGSIM uses some models (Total mass change) and by the proposal there is a clear separation between observations and models, solutions from ACs are comparable & combinable.</p> <p>UM & AJ supported provision of monthly tidal mean models. FF supported the approach, but would advise implementation on a 'step by step' basis, starting at a GRACE science team meeting. AJ suggested providing presentations at the next project meeting. MW proposed writing a statement of intent. PD & JF raised concerns over the new L2 product on the Hydrological community – TMG responded that it would be possible to 'leave out' the new products. AG expressed his view that the higher processing (the 'cook book' approach) necessary with L2 products may put Hydrologists off this source.</p> | AI#017 |
| 4 | WP3 Integration of complementary data (TvD) | |
| | <p><i>Annex 05: WP3_Reference_Frame_Products (AS)</i></p> <p>There is a problem with the existing RINEX data, (availability of less than 50% is high). AS reports that from Wednesday morning (20.1) the Reference Frame products will be removed from the ftp server, to be replaced by GRACE orbit data (at the end of January).</p> <p><i>Annex06: WP3_Gravity_Field_Coefficients (AJ)</i></p> <p>AJ presented the SLR analysis performed at UBERN (on behalf of work undertaken by Andrea Maier at AIUB, UBERN). Recently a bias in the UBERN C20 series has been discovered, investigations are ongoing, possibly not a simple re-scaling problem due to the use of the GM and AE values. After the bias problem has been solved the next step will be to extend the SLR time series to include the lifetime of GRACE data and to include more SLR satellites.</p> <p>TMG raised the possibility of a problem with the AOD model</p> <p><i>Annex07: WP3_Validation_with_GNSS_loading (ZL)</i></p> <p>SOPAC & JPL can now be used for validation purposes.</p> <p>TMG – AOD has to be added to the EGSIM model going forward, AS to provide data including coordinates to ZL</p> <p>TMG how do you average GPS time? Average GNSS from daily to monthly.</p> <p><i>Annex08: WP3_GRACE_Validation_with_OBP (LP)</i></p> <p>RL05a variance gives a generally good performance over all frequency bands.</p> <p>TMG recommended using a different filter than DDK1, LP responded that subsequent filters are being investigated.</p> <p><i>Annex09: WP3_GIA_correction_for_hydrology (HS)</i></p> <p>The GIA model is being expanded to encompass the whole globe (Fennoscandian part to be unveiled at EGU2016), models in use currently have various constraints</p> <p>TMG, Earth rotation is included.</p> <p><i>Annex10: WP3_Hydrology_at_CNES (JML)</i></p> <p>JML presented work undertaken at GRGS on the oceanographic validation of time variable gravity solutions from GRACE. The GRGS team used the Caspian Sea and the Zapiola Gyre as test areas and compared GRACE data downloaded from ICGEM to AVISO+ and HYDROWEB. In the open sea ocean variability meant that the maximum</p> | |

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| | <p>correlation was 79%, monthly time sampling is therefore not short enough.</p> <p><i>Annex11: WP3_Historical_Flood_compilation (HZ)</i></p> <p>3 suitable test cases identified (Danube, Ganges/Brahmaputra & Mekong). Automated flood masks will be added and then the results compared with semi-automatic approaches.</p> <p>FF-why are we limiting flood data to 2006/7? HZ is willing to add suitable events. TG can you also look for drought events? This would be possible, depending on the length of time series (HZ)</p> | |
| 5 | WP4: Scientific Service (UM) | |
| | <p><i>Annex 12: WP4_Solution_Combination (YJ)</i></p> <p>YJ introduced work undertaken on Validation of a Combined Solution by using Hydrology, Cryology, GIA, & GPS Loading. A simulation study will be conducted to find the most promising strategy to combine different gravity field solutions on the combination. The Degree 90 solution from Graz is still better than the combined solution taken from the individual Analysis Centres. As the weighting scheme does not function for the whole spectrum, YJ is studying why the weighting does not function as expected.</p> <p>CG suggested looking at both variances and co-variances</p> <p><i>Annex13: WP4_EGSIEM_Combination_Assessment (UM)</i></p> <p>UM gave a presentation on behalf of the EGSIEM collaborator Martin Horwath at TUD who has been analyzing the EGSIEM experimental solution against other available solutions (CSR (96), truncated to degree 90, GFZ RL05a (90), ITSG 2014 (90), AIUB RL2 (90)). Analysis of the spatial domain shows EGSIEM outperforming other solutions (post smoothing). ITSG solution shows the least noise, so weighting should be tweaked to include more input from ITSG. Noise: EGSIEM shows lowest RMS.</p> <p>JML – Deserts are a better example for noise levels than oceans. UM responded that larger ocean areas offer better smoothing options, perhaps we can include the Sahara.</p> <p>JK – artificial reservoirs, though small, give much better levels UM to send time series to JK for further validation</p> <p>JK asked how the weighting was derived, UM said that individual contributions of all ACs are compared to the arithmetic mean of all contributions. Weights are defined as the inverse of the sum of squares of the differences.</p> <p><i>Annex14: WP4_SLR_Activities_at_DGFI (MB)</i></p> <p>The consortium would like to extend their thanks to Mathis Bloßfeld of TU München who was invited to present work being undertaken at DGFI, especially the multi-satellite approach. The DGFI-TUM can provide SLR NEQs with full variance/co-variance information in SINEX format back until 1972.</p> <p>AJ – degree 20 – constraint is made to the static field?</p> <p><i>Annex15: WP4_GRACE_SLR_Combination (UM)</i></p> <p>AIUB 10x10 SLR + GRACE combination SLR had some influence on degree 2, low degree sectorial and zonal coefficients. It was found that it is not necessary to replace C20 coefficients. First monthly gravity field solutions derived from GPS orbits of SWARM (JE)</p> | |

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| | <p><i>Annex16: WP4_Swarm (JE)</i></p> <p>The consortium would like to extend their thanks to João Encarnação of TU Delft who was invited by the consortium to present the status of SWARM gravity field determination, which may act as a temporary solution until GRACE FO is fully operational.</p> <p>JK asked for clarification over the correlation coefficients, JE responded that the full (unprocessed) signal, confirmed that no accelerometer data has been used, but TU Delft will shortly release one year of accelerometer data for SWARM-C.</p> <p><i>Annex17: WP4_SLR_Discussion (AJ)</i></p> <p>After the presentation from JE AJ presented a discussion on incorporating SLR data into the EGSiem project</p> <p>MW asked for a constraint free solution, MB said this would be possible and MW offered support for incorporating other SLR data JML and FF responded that they could provide data.</p> <p>MW suggested that TMG added a slide to his upcoming EGU presentation to invite other users</p> <p>TMG – degree 1 terms will need external data – so D1T should be provided as additional data</p> <p>FF – an SLR processing standard document should be written – AJ this will be added to Deliverable 2.1</p> <p>AJ asked how GPS hi-SST could best be incorporated into the project:</p> <p>GPS hi-SST could act as a back-up in case of a problem with GRACE FO, FF we would then need to move quickly (c. 6 months). TMG - this is a complicated process to compare with GRACE, AJ there is certainly a lot to learn in terms of SWARM. AJ asked JE to lead effort on GPL hi-SST, AJ said that this would be a ‘best effort’ approach and may take c. 6 months to set up, JE responded that TU Delft could not commit to any timescale at the moment, and that the data originates from ESA</p> <p>AJ – the consortium is open to additional data, UBERN will present a plan at the next meeting on how to incorporate the 2 new data types and how to welcome new contributors.</p> | <p>AI#018</p> <p>AI#019</p> |
| <p>6</p> | <p>WP5: NRT and Regional Service (FF)</p> | |
| | <p><i>Annex 18: WP5_NRT_Regional_Service_at_TUG (AK)</i></p> <p>From their side TUG are happy to confirm milestone 2 as completed</p> <p>TG - in relation to biases AK stated that the hydrological model used ‘does not matter’ TMG interjected that differences are quite small. AG suggested using GLDAS as a hydrological model for testing purposes</p> <p><i>Annex19: WP5_Status (CG)</i></p> <p>CG presented to the consortium the work being undertaken at GFZ under WP5, currently the convergence of Graz and GFZ stochastic modeling is in progress. Work is being completed to Milestone 2 will be completed by the end of February</p> <p>PD queried using correlation patterns and suggested looking at longer time series</p> | |

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| 7 | WP6: Hydrological Service – (AG) | |
| | <p><i>Annex20: WP6_Hydrological_Service (BG)</i></p> <p><i>Annex 21: WP6_Flood_Volume_Estimation (HZ)</i></p> <p>General discussion (JF/UM) about the discharge from basins and how the mass of water is counted. Discharge water for Ganges is taken from observed water level at gauging stations, whereas GRACE is showing more water mass (subsurface water included).</p> <p>AG advised that they want independent water mass change observations to evaluate the GARCE products</p> <p>JK - Radio telemetry of water levels from colleagues in Bangladesh should be due to come online shortly. Possibly use discharge derived from altimetry data. An idea could be to contact Faisal Hossein (Uni Washington) as he had a project funded under NASA SERVIR for developing a system for deriving operational discharge from altimetry over Indus, Ganges & Brahmaputra.</p> <p>MW – there appears to be a phase shift in the Danube readings, (BG) storage increases then discharge follows (at the Ganges).</p> <p><u>Test Cases Ganges-Brahmaputra (HZ)</u></p> <p>HZ proposed the following approach: a raster image is placed on the flood mask and then make a calculation of the water lever for each cell of the raster grid. DLR will then need to compare with altimetry data and define the size of the raster.</p> <p>JK – A general problem when comparing to observational data is that colleagues in India only provide such data above a level that is considered as ‘dangerous’.</p> <p><u>Seasonal forecasting of streamflow in central Asia (AG)</u></p> <p>Using GRACE data and comparing to river discharge data in a series of models we can possibly provide a predictor. Different approaches followed which still showed large differences from discharge data. Combined solutions in 2005-10 offer accurate predictions (the EGSiem combined solution was ranked 4th) GRACE water storage data alone is not useful as a predictor.</p> <p>JK queried accuracy over longer timescales – AG confirmed that 5 year predictions are much more accurate than 10 year timeframe (2003-12), longer EGSiem combined solutions desirable (beyond the 2005-2010 period).</p> | |
| 8 | WP7: Dissemination and Exploitation (AJ) | |
| | <p><i>Annex22: WP7_Project_Website (KCG)</i></p> <p>Google Analytics data shows nearly 10,000 page hits on egciem.eu since the beginning of March 2015, however, the engagement rate appears low. MW advised that the front page should cover an introduction of the project, as well as the blog.</p> <p><i>Annex23: WP7_Compensation (TB)</i></p> <p>Will be called ‘The EGSiem Challenge’ and planning is at an advanced stage. TB proposed that a separate/embedded website www.challenge.egciem.eu should be created. As the prize for the competition will be an internship (x2) we need another institution (other than LUH) to host an internship.</p> <p>JK posed the question that students may require ECTS points as a ‘reward’, though such an arrangement was not foreseen. TG asked for clarification over who would be allowed to enter – this would be only EU residents.</p> | |

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| | <p>As a general point YJ recommended a QR code be made and distributed to include on posters etcetera to provide a direct link to the project website.</p> <p><i>Annex24: WP7_Summer_School (AJ)</i></p> <p>AJ proposed that members of the executive board should form a Summer/Autumn School organising committee. This was accepted.</p> <p>JF asked who should act as lecturers – just EGSiEM, or external members? It was agreed that external lecturers would be invited.</p> <p><i>Annex25: WP7_Dissemination_Activities (JF)</i></p> <p>JF gave an overview of the dissemination activities that had taken place within the first year of EGSiEM. MW highlighted that the website publications page needs to be updated.</p> <p>JK suggested a specific area set aside on the website for journalists and high school students, thereby providing targeted information.</p> <p>SB suggested that an email should be sent to all when a new Blog entry is online</p> <p>Action Item: TvD to plan submissions for dedicated sessions at conferences (Task 7.5)</p> <p>It would be useful to create a link to the newsletter on the right hand side under the sign up section (TB) Tamara also took the opportunity to remind people of the deadline for Newspaper contributions (NOW)</p> | |
| 8 | External Guest Presentations | |
| | <p>TG gave a short oral presentation about future gravity mission planning and asked those present to provide support into the planning of such.</p> <p>Letter of Intent deadline 1st February</p> <p>Proposal Deadline mid-June</p> <p>MW advised consortium members to acquaint themselves with their national ESA representative.</p> | |
| 9 | Mid Term Review (KCG) | |
| | <p>KCG briefly advised the general meeting of the mid-term review meeting to be held in BRU on the 7th March 2016, this will involve:</p> <p>AJ/KCG/TvD/AG/TMG/UM/Project Officer(s) and René Forsberg of the Danish Technical University (External Expert Reviewer)</p> | |
| 13 | Meeting Review and Publication Plan (AJ) | |
| | <p>For the last topic AJ invited a general discussion about publications, he proposed the idea of a publication plan document and also proposed a special issue of the Journal of Geodesy (GRACE anniversary issue?) and asked for other suitable journal titles to be mentioned, specifically any Hydrological Journals which could be approached.</p> | |

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| | <p><i>Next meeting:</i></p> <p>FF kindly offered to host the next project meeting in June at GFZ in Potsdam, Germany, date confirmed as 2. – 3. June 2016, the meeting is expected to start in the morning on Thursday, 2. and finish around lunchtime on Friday 3. June.</p> <p>AJ thanked UL for hosting the meeting and thanked everyone for their input.</p> | |
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| Action Item Status List (open and new AI's) | | | | |
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| A.I. | Originator | Actionee | Action Description | Due Date |
| 006 | EGSIEM | WP Managers | Collect ideas for paper topics to set up a publication plan | 31.03.2015 |
| 011 | EGSIEM | GFZ (AG), DLR, CNES | Establish the interfaces between ZKI, Hydrology, and CNES to clarify the possibility to derive flood volumes and the potential role of altimetry (Hydroweb). | 30.09.2015 |
| 012 | EGSIEM | EGSIEM ACs | Each AC to provide a test SINEX file of a monthly GRACE solution (NEQ information). Still waiting for NEQ from CNES. | 31.07.2015 |
| 013 | EGSIEM | GFZ (FF), UL, GFZ (AG) | Compile a list of EGSIM L3 products, Compile a list of sources for degree 1 terms and C20 | 30.09.2015 |
| 014 | EGSIEM | CNES | Validation of GRACE solutions over oceans using altimetry and ocean surface topography | 31.12.2015 |
| 015 | EGSIEM | UL | Check availabilities of GRACE movies and possibilities (persons) to update them | 31.12.2015 |
| 016 | EGSIEM | All | Milestone 002 (<i>Implementation and Preparation Review</i>) to be completed. | 29.02.2016 |
| 017 | EGSIEM | TUG | TMG to provide a plan for the removal or restoration of background models | 02.06.2016 |
| 018 | EGSIEM | UBERN | SLR processing standard text will be added to Deliverable 2.1 | 02.06.2016 |
| 019 | EGSIEM | UBERN | UBERN to draft a plan on how to incorporate SLR data and how to welcome new contributors. | 02.06.2016 |
| 020 | EGSIEM | UL | Submission plan to be created for dedicated sessions at conferences (see Task 7.5) | 31.3.2016 |