EGSIEM
European Gravity Service for Improved Emergency Management

HORIZON 2020

EO-1-2014: New ideas for Earth-relevant space applications
Research and Innovation action

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Summer school Lecture Notes

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1.Change Record

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2.Terms

The EGSIEM description of Action states that young scientists and students will be prepared for usage of EGSIEM products in a one-week summer school to be conducted in the third year of the project. The original text states that the school would provide…

> "…half-day presentations (morning sessions) on the topics covered within the project and train the participants in the usage of the data (afternoon sessions). The presentations will be augmented by inviting high profile guests giving presentations on selected topics. Lecture notes will be prepared and distributed resembling also a comprehensive manual to the products. The notes will be made available on the website."

This report will give a brief insight into the planning and preparation of the summer school, and provide weblinks to the presentations provided at the school.

3. Summary

As part of the overall dissemination and exploitation strategy of the EGSIEM project a summer school was envisaged from the very beginning of project planning. The school was designed to serve two main purposes i) to teach a broad-section of scientists how to use EGSIEM (and related) products, and ii) to learn how to produce and interpret gravity field data. The school was initially planned to take place in the second half of the final project year which we are pleased to confirm that it did, however, because of a delay in finding suitable premises (and additional funding) it was eventually launched as an **Autumn** school as it took place in September. Although funds had been set-aside within the original application to support lecturer travel it was decided that to encourage younger scientists to attend, the school itself would need to be free to all (though applicants would need to cover their travel and accommodation costs). In addition to students who applied to come to the school (there was a pre-selection process in place, which is common amongst such schools) it was also attended by two winners of the earlier EGSIEM competition whose travel and accommodation were paid for by the project.

4. Advertisement

The main instrument for advertising and disseminating information about the school was a dedicated subpage of the project website (egsiem.eu/autumn-school), this was initially published in March 2017.
In addition to displaying the project poster (this was updated when new information was available, ie revised lecturer list and indicative timetable) and application deadlines and details it was later used to disseminate practical information on travel and accommodation. In addition to the webpage the consortium was able to utilize some aspects of social media, and there were regular updates on Facebook and Twitter.
The school was advertised by the consortium to their students during lectures and was also featured in the IAG (International Association of Geodesy) Newsletter. What produced the most far-flung results were a series of emails which advertised the school and which were targeted at all known european Geodesy higher education centres (building on work undertaken by colleagues at Leibnuz Universität Hannover), according to feedback gained from students the event was also featured on the ESA and IUGG websites.

When the definitive list of attendees was known the webpage was then superceded by an email distribution list for attendee specific information and a dedicated subpage was set up purely for attendees (students and lecturers) where they could access supporting information provided by the lecturers (software, practical information as well as presentations).

5. School Details

The Autumn School took place at GFZ, Potsdam from Monday, 11. until Friday 15. September There were 46 students in total, this included the third and sixth placed EGSIEM competition winners. Unfortunately the lady who was placed third overall was unable to attend owing to a clash with a graduation ceremony, the fifth-placed winner was invited but they also could not come so it was actually the sixth-placed winner who attended. Including the twelve lecturers and an additional EGSIEM consortium member the total people attending was 59 (not including local support staff at GFZ Potsdam).

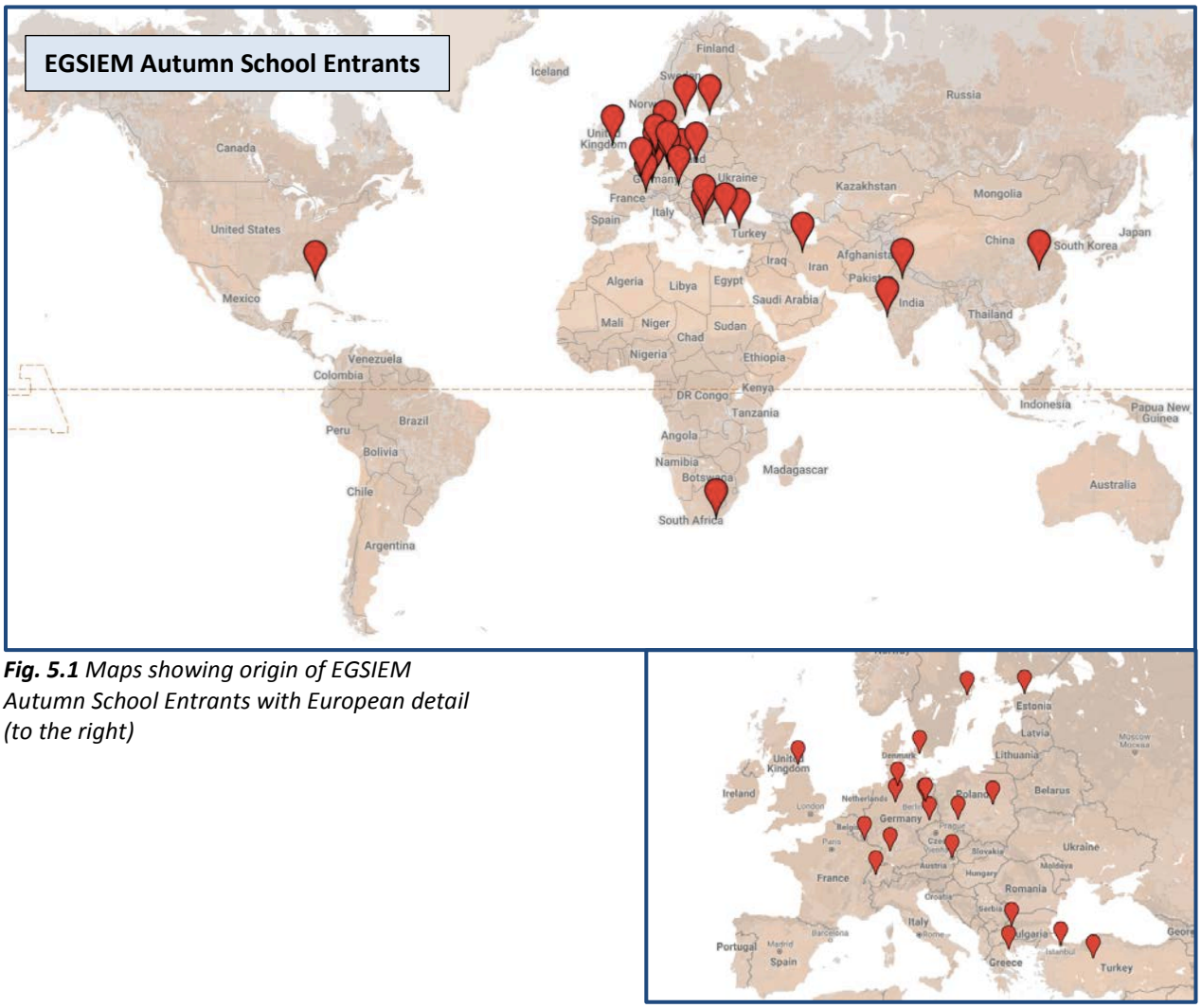

Fig. 5.1 *Maps showing origin of EGSIEM Autumn School Entrants with European detail (to the right)*

The School was attended by a wide-range of attendees from different geographical and disciplinary backgrounds (of the 46 students, 28 were currently studying Geodesy, 12 were from a hydrological background 3 came from physics and 1 engineering). As you can see from Figure 5.1 the majority of attendees came from Europe, but some students came from further afield.

In Table 5.1 (below) you can see the format of the school.

DATE	Morning			Afternoon			Evening
Monday (11. September)	***Arrivals***			**Registration & Welcome** Jäggi/Flechtner 14:00-15:00	**GPS & GRACE Intro** Adrian Jäggi · Ulrich Meyer 15:00 – 17:30		**Ice Breaker** All 18:00
Tuesday (12. September)	**GRACE Analysis** Torsten Mayer-Gürr		Lunch at GFZ Canteen	**Modelling the Hydrological Cycle (Hydrology I)** Andreas Güntner		Dinner break	**Assimilation of GRACE data into hydrological models (Hydrology II)** Annette Eicker 19:00-20:30
	Lecture 09:30-11:00	**Practical** 11:30-13:30		**Lecture** 14:30-16:00	**Practical** 16:30-18:00		
Wednesday (13. September)	**Ice sheet signals** Martin Horwath			**GIA** Holger Steffen			**GNSS Loading** Tonie van Dam 19:00-20:30
	Lecture 09:30-11:00	**Practical** 11:30-13:30		**Part I-Introduction** 14:30-16:00	**Part II-Observations** 16:30-18:00		
Thursday (14. September)	**Remote Sensing** Hendrik Zwenzner			**GRACE FO** Frank Flechtner 14:00-15:00	**Cruise** All 16:00-19:00		
	Lecture 09:00-10:30	**Practical** 11:00-13:00					
Friday (15. September)	**EGSIEM Tools** Stéphane Bourgogne & Matthias Weigelt			***Departures***			
	Lecture 09:00-10:30	**Practical** 11:00-13:00					

Table 5.1 *Timetable of the EGSIEM Autumn School*

As one can see, the timetable was arranged broadly thematically to allow a logical progression for students who may not have been specalists in all fields covered by the school. Such an approach was only possible because of the flexibility of the invited lecturers, for which we would like to thank them, and for their time and enthusiasm.
In addition to the scientific events there were two free social events to encourage students to mingle and get to know each other and their chosen disciplines. The first was a drinks reception given on Monday evening and the second was a cruise on the lake surrounding Potsdam.

6. Lecture Notes

The presentations given at the Autumn School are available at the following urls

Presenter	Title	URL
Jäggi	Precise Orbit Determination of Low Earth Orbiters using the Global Positioning System	www.egsiem.eu/images/static/Autumn-School/Presentations/Jaeggi.pdf
Meyer	GRACE mission, gravity field determination and EGSIEM scientific combination service	www.egsiem.eu/images/static/Autumn-School/Presentations/Meyer.pdf
Mayer-Gürr	GRACE Analysis	www.egsiem.eu/images/static/Autumn-School/Presentations/Mayer-Guerr.pdf
Güntner	Modelling the Hydrological Cycle	www.egsiem.eu/images/static/Autumn-School/Presentations/Guentner.pdf
Eicker	Assimilating GRACE Data into Hydrological Models	www.egsiem.eu/images/static/Autumn-School/Presentations/Eicker.pdf
Horwath	Ice Sheet Signals	www.egsiem.eu/images/static/Autumn-School/Presentations/Horwath.pdf
Steffen	Glacial Isostatic Adjustment - An introduction	www.egsiem.eu/images/static/Autumn-School/Presentations/Steffen.pdf
van Dam	Surface Mass Loading of the Solid Earth: Theory and Examples	www.egsiem.eu/images/static/Autumn-School/Presentations/van_Dam.pdf
Zwenzner	Remote Sensing	www.egsiem.eu/images/static/Autumn-School/Presentations/Zwenzner.pdf
Flechtner	Status of the GRACE Follow On Mission	www.egsiem.eu/images/static/Autumn-School/Presentations/Flechtner.pdf
Weigelt	Practical: EGSIEM Plotter	www.egsiem.eu/images/static/Autumn-School/Presentations/Weigelt.pdf
Bourgogne	EGSIEM Plotter	www.egsiem.eu/images/static/Autumn-School/Presentations/Bourgogne.pdf
All of the above are available at: www.egsiem.eu/autumn-school/		

7. Acknowledgements

In addition to the support of the European Commission the EGSIEM project would also like to thank the generous assistance provided by the German Federal Ministry of Training and Research and the German Research Centre for Geosciences, without whom the School could not have taken place in its final format.

GFZ Helmholtz Centre Potsdam
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8. Annexes

Photo 8.1 *Group Photo of EGSIEM Autumn School Attendees (Photo Credit GFZ Potsdam)*

Photo 8.2 *Social Event on the Thursday evening of the Autumn School (Photo Credit, Prof. Annette Eicker)*

Fig. 8.2 *EGSIEM Autumn School Flyer*