

FLOATING UNIVERSITY REPORT:

The RV Aranda 22nd April – 29th April 2009



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Authors Darya Ryabchuk, VSEGEI, Russia Mia Kotilainen, University of Helsinki, Finland	Date 29th of June 2009		
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VSEGEI = A. P. Karpinsky Russian Geological Research Institute, St. Petersburg, Russia

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Floating University Participants during the RV Aranda SEDU 2009 Cruise (22.-29.4.2009)

Chief scientist: Harri Kankaanpää, SYKE, Finland

INFLOW (and Baltic Gas) Participants:

Laura Arppe, Department of Geology, University of Helsinki, Finland (26.-29.4.2009)
Slawomir Dobosz, Szczecin University, Poland (26.-29.4.2009)
Sabine Flury McGinnis, Århus University, Denmark (22.-25.4.2009)
Jyrki Hämäläinen, GTK, Finland (jyrki.hamalainen@gtk.fi)
Jørn Bo Jensen, GEUS, Denmark (22.-25.4.2009)
Juha Karhu, Department of Geology, University of Helsinki, Finland (26.-29.4.2009)
Karoline Kabel, IOW
Anu Kaskela, GTK, Finland (26.-29.4.2009)
Aarno Kotilainen, GTK, Finland
Mia Kotilainen, Department of Geology, University of Helsinki, Finland (26.-29.4.2009)
Bryan Lougheed, Lund University, Sweden (22.-25.4.2009)
Matthias Moros, IOW, Germany
Thomas Neumann, IOW, Germany
Christian Porsche, IOW, Germany (26.-29.4.2009)
Michael Pötzsch, IOW, Germany
Daria Ryabchuk, VSEGEI, Russia (22.-25.4.2009)
Alexander Sergeev, VSEGEI, Russia (22.-25.4.2009)
Ian Snowball, Lund University, Sweden (22.-25.4.2009)
Joonas Virtasalo, IOW, Germany

* representing Baltic Gas (BONUS –project)

Other Participants:

Outi Hyttinen, Department of Geology, University of Helsinki, Finland (22.-25.4.2009)
Pinja Kasvio, Department of Ecological and Environmental Sciences, University of Helsinki
Anne Nykänen, Department of Ecological and Environmental Sciences, University of Helsinki
Olli-Pekka Penttinen, Department of Ecological and Environmental Sciences, University of Helsinki

Students:

Post-Docs: Laura Arppe (Leg 2), Joonas Virtasalo (Legs 1&2)
Ph.D –students: Slawomir Dobosz (Leg 2), Outi Hyttinen (Leg 1), Karoline Kabel (Legs 1&2), Anu Kaskela (Leg 2), Christian Porsche (Leg 2), Bryan Lougheed (Leg 1), Alexander Sergeev (Leg 1), Anne Nykänen (Legs 1&2) (Department of Ecological and Environmental Sciences/ Helsinki Univ.)
M.Sc.-student: Pinja Kasvio (Leg 1&2) (Department of Ecological and Environmental Sciences/ Helsinki Univ.)

GEUS = Geological Survey of Denmark and Greenland

GTK = Geological Survey of Finland, Espoo, Finland

IOW = Leibniz Institute for Baltic Sea Research Warnemünde, Germany

SYKE = Marine Research Centre of the Finnish Environment Institute, Finland

VSEGEI= A.P Karpinsky Russian Geological Research Institute, St. Petersburg, Russia

Introduction

During the SEDU 2009 cruise of R/V Aranda 22.-29.4.2009 (Kotilainen et al. 2009) in the frame of INFLOW Project (Holocene saline water inflow changes into the Baltic Sea, ecosystem responses and future scenarios) a program called the Floating University was organized.

The main function of the Floating University was to provide students from several different Universities and Institutions a task-based learning environment with several field and laboratory work activities. These activities included e.g. assistance in sediment coring, description of the stratigraphy, sediment sampling and sub-sampling (partly on deck and partly in the onboard laboratory), and several tasks in connection with the echo-sounding. In addition, lectures on the Baltic Sea geology and topics relating to INFLOW project were presented.

Leg 1: Helsinki – Mariehamn (22.-25.4.2009)

Before the cruise began (22nd of April 2009), there was a safety drill with demonstration and testing of safety equipment including survival suits and the tour around the ship (laboratories, library, locations of the safety boats, gym and sauna).

Research Professor Aarno Kotilainen presented a lecture on marine geological field research methods (including the use of echo-sounding for the proper sampling site selection and different sampling approaches).

The practical work on 22nd of April 2009 included participation in description and sub-sampling of the cores (slicing surface sediment cores, sub-sampling from long cores, and taking mini-ice finger samples) from MUC-, GEMAX corer and Gravity Corer for different analysis (paleomagnetic dating, geochemistry). There was a demonstration of an equipment for hydrological investigations (CTD, optics) and hydro-biological research (microbes, phytoplankton). One of the students was responsible for the collecting and documenting the sampling site information for every sediment core recovered (e.g. position, time and depth). Social program included the Ice Breaker party that was organized in the evening. All students were participating in that.

On 23rd of April the students planned the echo-sounding survey grid and calculated the way-points for that. Marine geologist Jyrki Hämäläinen was teaching how to interpret the echo-sounding profiles using MERIDATA[®] post processing system and the students were practicing the interpretation procedure. All students participated in echo-sounding night shifts (23.-24.04.2009), each for one hour.

On 24th of April the students participated in sediment description, testing the grain-size of long-core sections (up to 7 m) of different sedimentary units, slicing and different kind of sub-sampling.

On 25th two scientific lectures were included to the day's schedule. The first talk "P & T on dating methods" was given by professor Ian Snowball (Lund University). The second talk "Introduction to ecosystem modelling" was given by Dr Thomas Neuman (Leibniz Institute for Baltic Sea Research Warnemünde). Before arrival to Mariehamn students continued sediment slicing and sub-sampling practises. The R/V Aranda docked on Klintkaijen/west harbour of Mariehamn in the late afternoon. Saturday evening's social program included barbeque dinner onboard the RV Aranda. The party was followed by a tour to Mariehamn. Participants of the Leg 2 arrived to the RV Aranda by the midnight, as some students and senior scientists left the RV Aranda (those who where participating only in the Leg 1).

Leg 2: Mariehamn - Helsinki (26.-29.4.2009)

On Sunday, 26th of April The Aranda had reached the next site early in the morning. The weather remained unusually calm and sunny and the coring begun right after the desired site had been reached and verified on the echo-sounding profile. An interrelationship between the days the coring success and the teaching programme was once again defined and the actual programme for the day was planned. It turned out that we had a very good and thus long day of sediment coring ahead of us, and with (partly) new students and scientist the sampling of the sediments would take the whole day. Between the coring sites there was the compulsory safety drill for the newcomers. The tasks for the students included surface sediment slicing and sampling, sediment description and sub-sampling (e.g. cubes for paleomagnetic dating). After a long day on deck and in the laboratory, two

of the students had echo-sounding night shifts (Laura, Anu) during the transition to the next days working area.

Monday 27th of April dawned with excellent coring conditions once again. However, one scientific lecture was included to the days schedule. The talk was given by Dr Olli-Pekka Penttinen (University of Helsinki, Department of Ecological and Environmental Sciences) and concentrated on ecotoxic compounds in the environment. The talk was followed by very interesting and fruitful discussion where different aspects of environmental research were considered as we had scientist and professors from several disciplines in attendance. Also the students were active in the discussion. On the coring sites the tasks for the students included some new procedures (sub-sampling for geochemistry and X-ray pens) along with the tasks learned yesterday (sediment sampling, slicing, sediment description, subsampling for paleomagnetic cubes). At night an echo-sounding "grid survey" was undertaken and the students (Christian, Pinja, Slawek, Anne) were having one hour long shifts. Some of the students were very enthusiastic about the echo-sounding and practically stayed up half of the night observing the recorded profile.

On Tuesday 28th of April 2009 yet another excellent coring day was ahead. After the lunch we organised another seminar. This time the students were giving talks about their special field of expertise. Slawomir Dobosz, Szczecin University, Poland was talking about the topic of his Masters Thesis dealing with diatom analysis. The talk was very good with excellent SEM-pictures of the diatoms. Pinja Kasvio (Department of Ecological and Environmental Sciences/ University of Helsinki, Finland) was also telling us about her MSc. work which is a part of extensive research of the environmental state of the city Espoo. Pinja's research is focusing on the state of the rivers and water basins. Anu Kaskela from the Geological Survey of Finland was taking us under the sea – the topic of her PhD work is the marine landscapes of the Baltic Sea. She presented impressive new maps of the submarine formations and their qualities. The students also worked hard with the sediments, gaining more hands-on experience on marine sedimentology. The tasks were the same as previous day, with one exception: mini ice finger sampling. The other tasks included sediment sampling, sediment description, subsampling (e.g. geochemistry, pal.mag. cubes, X-ray pens). In the evening everyone involved in INFLOW-project gathered in the "Eagles Nest", a cosy meeting room, where the project coordinator Res.Prof. Aarno Kotilainen summarised what kind of cores were recovered during the cruise and what analyses will be done on the samples in the future. At

night another echo-sounding "grid survey" was launched with a lot of night shifts (Anne, Christian, ex-student Mia, Anu, Pinja, Slawek, Karo, Laura, ex-student Aarno).

On Wednesday 29th of April the RV Aranda arrived at noon to Länsisatama, Helsinki. The students participated the whole day on disassembling the laboratory and deck equipment and packing them for transport. Also the samples had to be carefully packed to be sent to the appropriate laboratories.

Student feedback:

In order to receive feedback from the students and develop further the concept, we formulated a small questioner about the quality of the Floating University 22.-29.4.2009 onboard R/V Aranda.

Here are the questions with three sets of answers we required within the limited time:

1. Do you think that the FU (Floating University) was useful for you in regard to your research?

- Yes, very useful. To practice of sampling and have a chance to see sediments in situ are extremely valuable experiences.
- 1-2. Yes, in deed. FU was an excellent chance to see & experience the fieldwork in action. Also it was a good opportunity to meet other people involved in the project. It was good that we all got hands-on experience on sampling. Now I'm aware of the pros and cons of the sampling methods and the limits of the samples/analysis.
- Yes, very useful.

2. Where there any good practices in the FU?

- E.g. hands-on teaching, possibility to meet other students...many things.
- Good practices: 'everybody takes part in everything' meaning there was a chance to learn all the different techniques relevant to marine sediment research from cubing to echo sounding. The meeting at the end of the trip telling what was recovered and what analyses will be done on the stuff in the future was very good practice; it's more meaningful to work with the mud when you have a better picture of the overall aims.

3. What were the weak points of the FU?

- None. Even the weather was fine! :)
- The working days were sometimes overly long.
- 3. Better notification of schedule, cancelled things and planned events on board would be great, e.g. in the form of a morning meeting + somehow more noticeable notification board.

4. How would you rate the FU on scale 1-5 (1=very poor...5= excellent)

- 5, rate 4, 5-

Conclusion:

Altogether 11 students (including 2 post-docs) participated in “Floating University” organized during the RV Aranda SEDU 2009 Cruise 22.-29.4.2009. The Floating University experiment turned out to be very good and educative for the supervisors and senior scientists as well. The daily turnout of the coring was the main component to be taken into account while planning the teaching programme. On this cruise the outcome of the site coring was beyond the most optimistic plans, hence there were more opportunities for hands-on exercises than ever before. This modified our plans of the programme a great deal. Luckily, hands-on experience on marine sediments was exactly what the students needed most urgently – and from the pedagogical point of view, there hardly is more educative way to learn than by doing yourself. This cruise offered an excellent opportunity for educational achievements – and according to the feedback we are pleased to have met the purpose of the Floating University.

References:

Kotilainen, A., Ryabchuk, D., Kotilainen, M., Arppe, L., Dobosz, S., Hämäläinen, J., Karhu, J., Kabel, K., Kaskela, A., Loughheed, B., Moros, M., Neumann, T., Porsche, C., Pötzsch, M., Sergeev, A., Snowball, I., Virtasalo, J. 2009. INFLOW Cruise Report, SEDU 2009, the RV Aranda 22.-29.4.2009. INFLOW Interim Report No 1. Espoo: GTK. 19 p. Electronic publication. Available at <http://projects.gtk.fi/inflow/index.html> .

This report is a product of the "INFLOW" project.

INFLOW (Holocene saline water inflow changes into the Baltic Sea, ecosystem responses and future scenarios) –project studies ongoing and past changes in both surface and deep water conditions and their timing by means of multi - proxy studies combined with state-of-the-art modelling approaches. INFLOW uses sediment proxy data on a transect from the marine Skagerrak to the freshwater dominated northern Baltic Sea. The validated ecosystem models can provide simulated data for extreme natural climatic conditions over the past thousands of years (e.g. Medieval Warm Period, Little Ice Age). Proxy reconstructions will be compared to results from model simulations. These evaluated models will be used to provide predictions of the Baltic Sea ecosystem state at the end of the 21st century for selected IPCC climate change scenarios. Those scenarios of the future development of the Baltic Sea can form the scientific basis for political strategies adapting to future climate change.

INFLOW (2009-2011) is one of the BONUS research programme (<http://www.bonusportal.org/>) projects and it is funded by national funding agencies (e.g. Academy of Finland) and the EU Commission. Geologian tutkimuskeskus (GTK) coordinates the INFLOW project that has 9 partners in 7 countries of the Baltic Sea Region: Leibniz Institute for Baltic Sea Research Warnemünde (IOW), Germany; Geological Survey of Denmark and Greenland (GEUS), Denmark; Lund University, Sweden; Swedish Meteorological and Hydrological Institute, Sweden; University of Szczecin, Poland; Unifob AS, Bjerknes Centre for Climate Research, Norway; A.P Karpinsky Russian Geological Research Institute (VSEGEI), Russia; Department of Geology, University of Helsinki, Finland.

The INFLOW Report Series included following reports on 30th of June 2009:

INFLOW Interim Report No. 1 "INFLOW Cruise Report, SEDU 2009, the RV Aranda 22.-29.4.2009".

INFLOW Interim Report No. 2 "Floating University Report, the RV Aranda 22.-29.4.2009".

For more information on INFLOW –project see (<http://projects.gtk.fi/inflow/index.html>).