

Final report of project AKTION 70P6 PREFLOWAT3

Praha 20. 7. 2015

Final Report of the project AKTION 70p6 (2014-2015)

Project coordinator:

Prof. ing. Svatopluk Matula, CSc, Czech University of Life Sciences in Prague, FAFNR, Head of the Dept. of Water Resources

Project partner:

Univ. Prof. Dipl. - Ing. Willibald Loiskandl, BOKU Wien, Head of the Institute IHLW

Additional planned participants:

Ing. František Doležal, CSc., CULS
Ing. Getu Bekere Mekonnen, CULS
Ing. Ayele Theresa Chala, CULS
Ing. Andreas Schwen, PhD, BOKU
Dipl. Ing. Ilse Kogelbauer, BOKU*)
Ing. Faramarz Judy, CULS*)

Note: These participants changed their status during the project running. See following text.

Activities of the Project during 2014 and 2015

The support of this project was oriented to financing the exchange between PhD students and staff of both institutions and relevant units for the scientific co-operation and work, visits and some lectures. This project was the last possible extension of two previous projects related to this particularly co-operation between the CULS and BOKU. Especially positive role of project was to support and encourage PhD and MSc students from both universities to exchange places and to stay in the partners department as a temporary staff. Significant co-operation was established in the field of sharing supervision of Double Degree students of both universities. Attention was also given to finalising common work as the presentations at certain scientific meetings, conferences and congresses. Also the participation in the teaching and research activities of both partner institutions were successfully included into the common co-operation. Some results were presented as oral presentations, posters and papers in the proceedings and even the manuscript of the publication in international scientific journal with an IF. **All the presentations were published with the acknowledgement to the AKTION programme.**

During the period 2014 and 2015 several **personal changes** occurred. On the BOKU side **Ing. Kogelbauer** ended her job with BOKU due to move out of Wien for other job. On the CULS side the PhD student **Ing. Faramarz Judy** did not received the EU visas on time. He was not able to start his PhD with CULS but he has been accepted for the PhD in Ege University Izmir, Turkey.

Short description of the project activities within 2014-2015:

The PhD students from participating Universities (G. B. Mekonnen and A. T. Chala, both from CULS), five teachers (F. Doležal, A. Schwen, W. Loiskandl, S. Matula, M. Miháliková) were successfully running the project. The team was using successfully field, laboratory and other facilities of both universities. The participants exchanged the working places at CULS and BOKU rather frequently and based on the planned activities. The selected experimental fields (CULS in Prague – Suchbátka, Moravian

Karst and Chloumek. From the BOKU side in Gross Enzersdorf and Maria Saal were used for running of the project. These experimental places were used to collect the samples, observe the soil profiles and work together in the field and laboratory. On the both sides many soil-physical, hydro-meteorological, and other data were collected, the soil profiles and plant roots distributions were registered, several independent systems for soil water content measurements were used. Some of the experimental plots are also equipped with lysimeters. To collect and store data of the stations the automatic systems were used. Detailed soil physical, hydro-physical and other properties of the soil profile were available to the PhD students as well as research from the scientific databases of the stations. Detailed soil survey and measurements were organised and done by both PhD students with some minor help of the teachers from both Universities. The Institute of Hydraulics, and Rural Water Management BOKU and the Dept. of Water Resources FAFNR, CULS are very well equipped for the laboratory determination of soil hydro-physical properties, have large experience in using field lysimeters and electronic sensors and devices in the field. The laboratory background of both institutions was successfully used also for the practical training of PhD students in situ. (for example Mrs Miháliková has got experience how to use HYPROB system just installed in the CULS with the new software available). ended his MSc thesis and passed state exam at the CULS). Staff from both sides was participated in different field activities of the partners university.

The main activities of the staff (listed in alphabetic order of names):

Dr. Doležal

- Field station at CULS Prague-Suchdol management
- Visits 1X of BOKU focused on the teaching and excursions in the field related to the activities of the department
- Participating in lecturing, visiting the co-operating dept., field facilities
- Preparing the **publications**, presentations and posters at the conferences and meetings dedicated to AKTION Project. The teams of authors consists of the staff from both departments.
- Co-operation in the field experimental methods and experience exchange between departments

Prof. Loiskandl

- Managing the Austrian side of the project
- Organising of the visits of staff and stays of the PhD student, including MSc student
- Sharing official supervision of several Double Degree MSc Diploma students of both Universities
- Participating in lecturing, visiting the co-operating dept., field facilities and field trips
- Preparing lectures and participating in e-lecturing in the EU Summer School "Soil and Water 2015", organised by CULS, Prof. Matula in Turkey
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Visiting the co-operating dept., field facilities, excursion places

- Preparing, organising, lecturing in the field trip – scientific field trip - work in the soil profiles close to Maria Saal, Karincia organised by BOKU, Austrian Soil Science Society and Austrian Society for Root Research in June 2015.
- Preparing the presentations and posters at the conferences and meetings dedicated to AKTION Project, see the publication list

Prof. Matula

- Managing the whole Project and also the Czech side of the project
- Organising of the visits of staff and stays of the PhD student, including MSc student,
- Sharing official supervision of several Double Degree MSc Diploma students of both Universities
- Visiting the co-operating dept., field facilities
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Preparing the **publications**, presentations and posters at the conferences and meetings dedicated to AKTION Project, see the publication list.
- Preparing, organising, lecturing in the field work – scientific field trip to Moravian Karst with the participation of the Austrian colleagues
- Participating in the scientific field trip - work in the soil profiles close to Maria Saal, Karincia organised by BOKU, Austrian Soil Science Society and Austrian Society for Root Research in June 2015.
- Performing co-operation in the laboratory and field methods experience exchange

Dr. Mekonnen

- Participating in the visits and stays of the staff
- Participating in the laboratory measurement techniques (HYPROB) at both co-operating dept., participating in the field works and data evaluation
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Presenting of collective work

Dr. Miháliková

- Participating in the visits and stays of the staff
- Participating in the laboratory measurement techniques (HYPROB) at both co-operating dept., participating in the field works and data evaluation
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Presenting of collective work

Dr. Schwen

- Participating in the visits and stays of the staff and PhD student, presenting his work,
- Participating in the discussion at the Dept. of Water Resources in Prague
- Visiting the research places of the DWR CULS

The main activities of the PhD students:

Ing. Chala – PhD student

- Participating in the visits and stays of the staff and PhD student, presenting his work at BOKU, Wien.

- Learning the laboratory methods of the soil moisture measurement and visiting the field stations

Ing. Judy – PhD student

- Unfortunately due to general reasons – not receiving visas on time, he was not able to participate in PREFLOWAT

Ing. Kogelbauer - PhD student

- Unfortunately due to private reasons – job change, she was not able to apply for the one month fellowship, this was not possible to realise.
- Finalising publications, participating in the discussions and experience exchange in both dept.
- Participating in the scientific excursion organised by CULS

Citation of presentations and publications related to the project PREFLOWAT in 2014 - July 2015:

2014

1. Matula S., Miháliková, M., Mráz, A., von Unold, G., Chala, A. T., Hrkalová, M., Doležal, F. (2014): Zkušenosti z instalace a provozu malého polního lyzimetru SFM UMS. (Experience with installation and performance of a small smart field lysimeter SFM UMS. In Czech.) In: Hydrology of small catchments 2014, Prague, 22-23 April 2014. ÚH AV ČR, Praha, 8 p. and poster.
2. Doležal F., Miháliková, M., Matula, M., Moreira Barradas, J. M., Mekonnen, G. B. (2014): Vliv různých způsobů filtrace signálu na měření hustoty svislého toku vody malým inteligentním lyzimetrem SMF UMS (The effect of the signal filtration method on the measurement of vertical water flux density using a small smart lysimeter SMF UMS. In Czech.) In: Hydrology of small catchments 2014, Prague, 22-23 April 2014. ÚH AV ČR, Praha, 8 p.
3. Doležal, F., Vogel, T., Kogelbauer, I., Matula, S., Císlarová, M., Vacek, J., Loiskandl, W. (2014): Preferential percolation through unsaturated soil: uncertainty turned into working tool. In: The grand challenges facing hydrology in the 21st century. Dooge Nash International Symposium, Dublin, 24-25 April 2014, University College Dublin, p. 105-117, ISBN 9781905254835.
4. Doležal, F., Mekonnen, G.B., Matula, S., Miháliková, M., Fisak, J., Chala, A.T., Hrkalová, M., Moreira Barradas, J.M. (2014): Fine resolution soil water fluxes measured with a small Smart Field Lysimeter: The noise removal and further interpretation. Geophysical Research Abstracts 16, EGU2014-10198, 2014. Poster presented at European Geosciences Union General Assembly 2014, Vienna, 27 April – 2 May 2014.

2015

1. Doležal, F., Matula, S., Moreira Barradas, J.M. Rapid Percolation of Water through Soil Macropores Affects Reading and Calibration of Large Encapsulated TDR Sensors. Soil and Water Research, 2015, roč.10, č.1, s. 155-163. ISSN: 1801-5395. (journal with an IF)
2. Kogelbauer, I., Bářková, K., Doležal, F., Matula, S., Loiskandl, W. Preferential percolation quantified by large water content sensors with artificial macroporous envelopes. Hydrological Processes, 2015, Published online in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/hyp.10491. (journal with an IF)

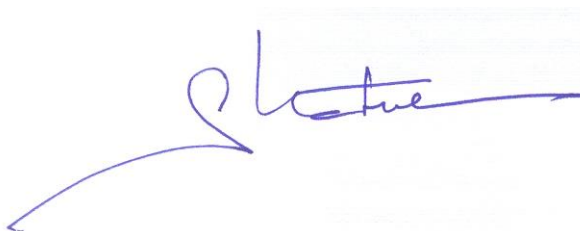
3. Matula, S., Mekonnen, G.B., Doležal, F., Fišák, J. Adjustment to rainfall measurement undercatch with a tipping-bucket rain gauge using ground-level manual gauges. Poster at the International conference EGU- Vienna, Austria, 2015.
4. Doležal, F., Matula, S., Miháliková, M., Fišák, J., Chala, A., T., Hrkalová, M. Vertical soil water fluxes measured with a small Smart Field lysimeter: The noise removal and further interpretation. Article in the proceeding and oral presentation. Conference: Influence of anthropogenic activities on water regime of lowland territory, June 2-4, 2015. Zemplinska Šírava, Slovakia. p. 32-41.
5. Mekonnen, G.B., Matula, S., Doležal, F., Fišák, J. Adjustment to rainfall measurement undercatch with a tipping-bucket rain gauge using ground-level manual gauges. Meteorol. Atmos. Phys. 2015, 127, p. 241-256. ISSN:0177-7971. (journal with an IF)

Conclusion

On behalf of the project participants I have to thank to the project AKTION, both offices of AKTION (in Praha and in Wien) and the staff there for help and co-operation in the management of the PREFLOWAT projects.

I have to note, that the extensions of the PREFLOWAT project to PREFLOWAT 2 and 3 have created excellent environment for the larger and longer close co-operation between both partners. It has given to the team of project opportunity to finalise some of their work into the publications, either together or independently but with the help, sharing knowledge and equipment, and giving support from both sides of the team. The departments now co-operate very closely, they share the teaching and scientific activities. They plan to enlarge common teaching activities (excursions for the students from similar MSc programmes in CULS and BOKU, hopefully with certain support of AKTION again).

Thank you very much, indeed.



Prague, July 20, 2015

Professor S. Matula
(on behalf of the project team)

Additional material:

The review of the budget of project 70p6 (in Czech)