Minutes from the CHASE-PL Project meeting in Warsaw

4 - 5 February 2015

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The meeting of the CHASE-PL (Climate change impact assessment for selected sectors in Poland) Project was held in the premises of the Water Centre – laboratory of the Faculty of Civil and Environmental Engineering of Warsaw University of Life Sciences (WULS-SGGW) in Warsaw, on days 4 and 5 February 2015.

The first day of the meeting, Wednesday, 4 February 2015 started a brief welcome and introduction by Prof. Tomasz Okruszko and SGGW Rector's attorney, Prof. Kazimierz Banasik. Meeting on 4 February was divided into three sessions. Session 1 was open to the public and focused on more general topics, while Sessions 2 and 3 were more oriented on the project itself. During Sessions 2 and 3 participants of the Work Packages 1, 2, 3 and 6 (WP1, WP2, WP3, WP6) showed their current progress.

Session 1 was started by Prof. Zbigniew W. Kundzewicz from the Institute for Agricultural and Forest Environment of the Polish Academy of Sciences (IAFE PAS) who delivered a presentation on global climate changes explaining their causes. He mentioned that the global changes accelerate and that year 2014 was the warmest year since 1893. He also talked about media, politicians and society attitude towards climate changes presenting the actual inconvenient truths versus convenient untruths often used by naysayers of global warming.

Next, Dr. Mikołaj Piniewski from Warsaw University of Life Sciences (WULS-SGGW) and Potsdam Institute for Climate Impact Research (PIK) presented two Polish case studies on climate change impact assessment on water quantity and quality. The first case study (The Narew basin) was related to Dr. Piniewski's PhD dissertation and EU FP6 SCENES project, while the second one (the Reda catchment) was related ERDF Baltic COMPASS project. Several topics relevant for CHASE-PL project project were presented: hydrological modelling with SWAT, multi-site calibration, climate change impact modelling, land use changes, scenario development and environmental flows. In summary, Dr. Piniewski listed a number of issues that could be done better compared to the previous applications, when implementing them in the CHASE-PL project.

At the end of the Session 1 Dr. Rasmus E. Benestad from Norwegian Meteorological Institute (Met Norway) delivered a presentation on climate predictability beyond traditional climate models that dealt mainly with the prediction of heavy rain events. He presented a

simple model based on empirical-statistical downscaling (ESD) - exponential distribution for wet-day amount and the data from Copenhagen, Denmark. Furthermore all shown results were derived using open-source R-package (esd) which was developed during this research for projects EU-SPECS, COST-VALUE and CORDEX-ESDM and is freely available.

Session 2 was started by short introduction of participants and then by Prof. Kundzewicz who gave presentation on the current status of the CHASE-PL project implementation. Prof. Kundzewicz reminded the main project objectives and project's division into workpackages and then continued with periodic report of project implementation. He also explained that WP1 will be extended by four months due to the possibility of continuing research thanks to savings on the meteorological data. Prof. Kundzewicz talked also about upcoming annual report that includes cost statements.

Next, Dr. Abdelkader Mezghani from Met Norway presented the preliminary results of trend analyses for precipitation in 58 stations in Poland. The main conclusions from analyzed data showed that there are nearly no long-term (1951-2013) linear trends but a few short-term linear trends in years 1982-2010 (e.g. for wet day frequency). However there was no trend in observed maximum values.

In the following talk, Dr. Dariusz Graczyk (IAFE PAS) talked about the changes in indices of hot extremes in Poland. Based on 62 Polish meteorological stations and data from 1961 - 2013 he analyzed the following thermal indices: number of hot days in summer and non-summer months, annual sum of hot days occurring in a heat waves, longest heat waves in a year, number of extremely hot days in a year, number of tropical nights in year. General conclusions were that there is an increasing trend in the frequency and quantity for the indices of hot extremes in Poland.

Next, Dr. Iwona Pinskwar (IAFE PAS) gave a presentation about change detection in observed climate of Poland at a range of scales. She presented selected thermal indices change with connection to agriculture, energy, health and mortality rates as well as precipitation indices based on the 55 precipitation stations. General conclusions were: more wet winter months - change in the precipitation to snow ratio during winter, drier agricultural season, a bit more wet summers, increase of the annual sum of precipitation.

At the end of the Session 2 Dr. Małgorzata Szwed (IAFE PAS) presented projections of changes in water balance in Poland. The projections of precipitation, areal evaporation (for 8 land use units) and runoff were based on the output form five ENSEMBLES RCMs. The main conclusions from this study were the following: (1) changes in the water availability in

Poland in the future due to temperature rise and changes in spatial pattern in precipitation are projected; (2) projections of runoff coefficients were highly uncertain.

Session 3 started presentation by Dr. Eirik Førland (Met Norway) about prospects for WP2 and projections of climate variability and change for Poland. There was also a short discussion about modelling the future snow conditions in which participants of the project declared the willingness to strengthen cooperation. Furthermore Dr. Førland mentioned about the other Polish-Norwegian project which is similar to CHASE-PL. Project is called "Climate change impact on hydrological extremes" (CHIHE) and is conducted by the Institute of Geophysics of Polish Academy of Sciences and the Norwegian Water Resources and Energy Directorate. Therefore an idea emerged to organize a joint meeting of both project participants to exchange experiences and concepts.

Next Dr. Piniewski gave a presentation about ongoing activities in WP3, especially about the development of the large scale models of Vistula and Odra river basins. He started with a brief reminder on WP3 Tasks and Milestones, then he proceeded to the summary of the finished and ongoing WP3 activities. Dr. Piniewski focused on spatial calibration approach emphasizing that the model will simulate the natural flows (i.e. isolated from the influence of the water management). He also presented the components of meteorological database, methodology of spatial interpolation of precipitation and temperature daily data, and current status of SWAT project setup (watershed delineation results).

Following M.Sc. Eng. Paweł Marcinkowski (WULS-SGGW) continued the subject of the ongoing activities in WP3, focusing on the meso-scale SWAT model implementations in the Upper Narew and Barycz catchments. He presented description and results of the field works in Barycz and Upper Narew catchments. Then he showed the development of the SWAT model setups of these catchments, discussing the Watershed delineation, Hydrological Response Unit definition with the methodology of land cover map preparation and finally results of the first simulation driven by the WATCH Forcing Data. These uncalibrated model simulations clearly showed the advantage of the WFD-ERA Interim over the WFD-ERA 40 dataset.

Next Dr. Dorota Pusłowska-Tyszewska from the Warsaw Technical University (WUT) presented results of the quantification of environmental flow requirements for the Barycz and the Upper Narew catchments. She presented the following steps that have led to calculation of environemtal flows: identification of fluviogenic habitats and their plant communities (present only in the Upper Narew catchment), identification of fish species

composition, hydrologic regime analysis, proposal of a method for determining environmental flows.

At the end of the Session 3 Dr. Ignacy Kardel (WULS-SGGW) presented the prototype of the CHASE-PL Interactive Web Mapping System (IWMS). Dr.Kardel talked about selected technology – ArcGIS Server 10.3 and Geoportal and asked for ideas and suggestions about which of the project output data should and could be shared, for whom and for what purpose and in which format the data should be available for download. He also concluded that there is a need for unification of the spatial data exchange format between WPs.

After Dr. Kardel's presentation there was short summary of the first day of the meeting, then participants took part in the walking tour around Warsaw Old Town and a joint dinner.

The second day of the meeting, Thursday, 5 February 2015 was entirely devoted to discussion and summary of the whole meeting. The following topics have been discussed: major tasks and prospects for the second year of the project, data exchange issues, possible publications and collaborations between WPs. The annual report was particularly discussed as well as other publications as a result of cooperation between different WPs. A general conclusion was that there is need to deliver more than there was promised at the beginning. An idea emerged that WP2 and WP3 could launch collaboration in snow modelling and gauge undercatch correction. Another important fields of collaboration between WP2 and WP3 are: selection of RCMs, bias correction of precipitation and temperature from selected RCMs (in particular the consistency between the "observed" climate datasets used for: A. Bias correction, B. SWAT model input). There was also an idea to compare results of the climate change projections with similar research in Poland's neighboring countries e.g. Germany. Prof. Tomasz Okruszko (WULS-SGGW) outlined the general framework for carrying out the WP4 tasks in index-based climate change impact assessment in 2015. It was clearly stated for which indices the output from WP2 or WP3 could be used. The proposed meeting with another Polish-Norwegian project in the second half of May 2015 was discussed. The meeting date is still under negotiation.

Additionally, once again, the issue of the data exchange formats and coordinate system between WPs was touched. It was concluded that these issues need further clarification after the meeting and an email from Dr. Kardel (WP6) with a proposed approach should be sent after the meeting.

The next annual meeting is planned in early 2016 in Oslo.

Annex

Agenda:

Wednesday, 4 February 9:30 – 17:30

Coffee and tea (9:30)

Session 1 (10:00 – 11:30)

1. Zbigniew W. Kundzewicz - Climate change perception in Poland. The inconvenient truth is really very inconvenient
2. Mikołaj Piniewski - Climate change impact assessment on water quantity and quality - two Polish case studies
3. Rasmus Benestad - Climate predictability beyond traditional climate models.

Coffee break (11:30 – 12:00)

Session 2 (12:00 -14:00)

1. Zbigniew W. Kundzewicz – CHASE-PL – status of the project implementation
2. Abdelkader Mezghani – Polish meteorological observational records and preliminary results of their use in CHASE-PL
3. Dariusz Graczyk - The heat goes on – Changes in indices of hot extremes in Poland
4. Zbigniew W. Kundzewicz & Iwona Pinskwar - Change detection in observed climate of Poland, at a range of scales (WP1)
5. Malgorzata Szwed - Changes in water balance in Poland - projections

Lunch (14:00 – 15:00)

Session 3 (15:00 – 17:00)

1. Eirik Førland- Prospects for WP2 (Projections of climate variability and change for Poland, comparison with control period)
2. Mikołaj Piniewski - Towards large scale models of the Vistula and Odra river basins: a review of ongoing activities
   Paweł Marcinkowski - Models of the Upper Narew and Barycz catchments: a zoom into finer scale
3. Dorota Pusłowska-Tyszewska - Environmental flows in the meso-scale catchments
4. Ignacy Kardel - Presentation of the Prototype CHASE-Interactive Web Mapping System

Summary of all sessions during a tea (17:00 – 17:30)

Thursday, 5 February 8:30 – 11:30

Session 4 - Discussion (8:30 – 11:00)

Light lunch and additional discussions (11:00 – 11:30)

Departure 11:30