Urban hydrology and Low Impact Development (LID) design exercise with SWMM

THURSDAY 16 FEB, 14:45-16:00, Group Work, Phase 1

After short introduction, the group work begins. The preassigned groups are shown in Table 1 on p. 2. Remember, you have about 1 hour on Thursday reserved for the group work.

The group's activities on Thursday:

1) **Organization of the group work:**
   Select one of the group members as a project manager. Project manager's task is to make sure that the group work proceeds in schedule.
2) **Sharing experiences from the induvial modelling work:**
   Each group member explains, what kind of LID design he/she created during the individual modelling exercise and the main findings about how well the LID system improved the catchment's hydrology.
3) **Selection of the optimal solution/best design:**
   Group decides the best solution for their study catchment. You can create a completely new design. You may select one of your individual designs as a template for the group design.

During the next teaching session on Monday 20 Feb, you will build your group model. You will repeat the rainfall-runoff simulations with your group model. Additionally, you will be given a specific research question for your group simulations.

Group no.	Group members	Catchment no.
Group A	Caroline Luhtajärvi Charlotta Toiskallio Frida Mitts Essi Leskinen Tuomas Ridanpää	Catchment 1
Group B	Veera Korteniemi Ville Vanhanen Pihla Seppälä Yingxin Deng Reeta Vaahtera	Catchment 2
Group C	Sofia Harri Kaisa Korhonen Tuomas Haapala Daria Popova Antonino Merlo	Catchment 3
Group D	Lauri Parikka Enni Isokangas Bhattarabhop Viriyaroj Tetiama Porokhivnyk	Catchment 1
Group E	Aarni-Matti Mäntyselkä Iiris Nieminen Nasti Valotie Joona Lepistö Bhattarabhop Viriyaroj	Catchment 2
Group F	Maiju Idman Juha-Matti Välimäki Wenli Lin Antti Kallanranta Tiia Westerberg	Catchment 3

MONDAY 21 FEB, 9:00-12:00, Group Work, Phase 2

After short introduction (9:00-9:15), the group work continues.

Instructions for Group Work: PHASE 2

Below you'll find an approximate schedule. **Your group presentation needs to be finished at 10:45**, when the group presentation session begins.

You are free to organize your work as you see best. For example, you can split your group to work with different tasks simultaneously (especially in those groups with >3 members).

Step 1. 9:15-10:15, CONDUCT GROUP SIMULATIONS AND COMPILE RESULTS

1) **Organization of the group work:**
   Select one of the group members as a project manager – you don't have to make changes in the roles chosen in last Thursday. Project manager's responsibilities are:
   1) *to make sure that every group member has tasks to do and participates in the group work process, and*
   2) *to make sure the group work will be finished on time (at 10:45).*
2) **Finish building your group LID design based on Thursday's group discussion.**
3) **Find you Group's research question (the list of questions on p. 4).**
4) **Conduct simulations with your group model to study your research topic. Compile your results.**
   It is probably advisable that you share the workload so that some group members work with selected simulations, others analyse the results, prepare presentation, etc.

Step 2. 10:15-10:45, PREPARE GROUP PRESENTATION

1) **Give your catchment LID design a selling/inspiring title**
2) **Prepare a PowerPoint presentation including the following:**
   - *title of your design*
   - *illustration of your LID catchment (explain, why did you choose it?)*
   - *state your research topic*
   - *present your key outcomes.*

   Important:
   - *Plan beforehand, how you are going to present your presentation.* ***It is also important not to exceed your presentation time.***
   - *Each group is given a 10-minute presentation time. This time includes both the presentation (about 5-7 minutes) and discussion afterwards (3-5 minutes).*
   - *In your slides, use text and illustrations such as images, graphs and tables.*

If your group work is finished and there is still time left before the group presentations, ask teachers advise on how to extend your group work.

Step 3. 10:45-11:45, GROUP PRESENTATIONS

Do not exceed your presentation time, so that all groups have time to present. Remember, that you are expected to listen to other presentations, not just your own group's presentation. While listening to other's presentations, think about possible questions or comments. After each presentation, we will have some time for questions and comments from anyone in the audience.

Research questions for Group Work on Monday 20.2.2022 9:00-12:00

Group A (Catchment 1):

Impact of the design storm intensity on runoff generation and LID performance?

Simulate your catchments (with and without LID units) under different design storm events. How does the catchment behavior change under different storm conditions? Can your LID system still perform well under different design storm situations?

Group B (Catchment 2):

Impact of long-term weather conditions on runoff generation and LID performance?

Simulate your catchments (with and without LID units) using the long-term rainfall data for summers with very different weather conditions (a very dry summer in 2006 and a very wet summer in 2005). How does the catchment behavior change under different weather conditions? How is your LID system performing under different weather conditions?

Group C (Catchment 3):

Impact of the design storm intensity on runoff generation and LID performance?

Simulate your catchments (with and without LID units) under different design storm events. How does the catchment behavior change under different storm conditions? Can your LID system still perform well under different design storm situations?

Group D (Catchment 1):

Impact of long-term weather conditions on runoff generation and LID performance?

Simulate your catchments (with and without LID units) using the long-term rainfall data for summers with very different weather conditions (a very dry summer in 2006 and a very wet summer in 2005). How does the catchment behavior change under different weather conditions? How is your LID system performing under different weather conditions?

Group E (Catchment 2):

Impact of the design storm intensity on runoff generation and LID performance?

Simulate your catchments (with and without LID units) under different design storm events. How does the catchment behavior change under different storm conditions? Can your LID system still perform well under different design storm situations?

Group F (Catchment 3):

Impact of long-term weather conditions on runoff generation and LID performance?

Simulate your catchments (with and without LID units) using the long-term rainfall data for summers with very different weather conditions (a very dry summer in 2006 and a very wet summer in 2005). How does the catchment behavior change under different weather conditions? How is your LID system performing under different weather conditions?