



Hydrology in your backyard

WHAT HAPPENS TO WATER IN YOUR GARDEN AND HOW CAN YOU TAKE MEASURES TO IMPROVE THE WATER-USAGE

Preface

This assignment has been done for the course Climate City Campus, part of the BSc Honours Programme of the TU Delft. The task was to create an assignment for high-school student about land-use changes by which they gain qualitative and quantitative insight in the process related to the local water cycle. Besides that, students should learn the basics of programming with Microsoft Excel. In this short report a short summary will be given of the assignment and feedback, provided by actual high-school student, will be explained.

Assignment

The assignment for the high-school students consist of several section:

1. Introduction
2. Underlying theory of the water cycle and the influence of humans
3. Explanation assignment
4. Assignment 1: describing fluxes going in and out the gardens qualitatively
5. Explanation formula Penman-Monteith
6. Real weather-data from the KNMI
7. Basics of Microsoft Excel
8. Assignment 2: calculating fluxes going in and out the gardens quantitatively
9. Overview and some questions

With this structure the theory is explained gradually and the assignments get more difficult step-by-step.

The assignment focuses on three gardens (figures on cover). A green garden filled with plants, a garden with a big swimming pool and a paved garden. Students have to determine the processes that take place in every garden. When this is done correctly, they have to calculate with these processes. Input is taken from real weather data measured by KNMI at De Bilt in The Netherlands on Friday 5th June 2015. Finally, students have to answer some question to check whether they truly understand the topic.

Feedback

The assignment was given to three high-school students to test whether the explanations are clear and comprehensible and if the assignments are on a good level. Different feedback was received from the students:

1. The first student made the assignment in a hurry. She didn't read the introduction and assignment explanation but started the first assignment on described fluxes immediately. She did not understand what to do and made the first assignment by guessing. She did not proceed to the second one. She thought of the assignment to be professional and well designed, but difficult.
2. The second student made the assignment in an hour. She described the fluxes well, but had difficulty with programming. Therefore, she completed only the calculations of the first garden (though almost completely perfect). She thought some help would be handy, so that students are confident in their programming codes. The feedback

provided by Excel (correct/incorrect) was handy but did not give her help for small programming problems.

3. The last student made the assignment in an hour too. She made the complete assignment correctly. She said the assignment were clearly explained and not very hard. The explanation on the basics of Excel were very helpful because she, as the most other high-school student, had not been taught on this before. The overall assignment was fun and instructive for her.

From this feedback is concluded that the assignment is good in its current form. When given to a high-school class, it would be handy to have the basics of the theory explained by a teacher. This teacher could give some helping hand when a student gets stuck on some basic programming-issues. The design and structure of the assignment is perfect and on the difficulty is good for high-school students. Some students may have more difficulty, but for smart students, the assignment is still challenging.