

Developing a toolbox for running and visualizing 100 m resolution global groundwater model of PCR-GLOBWB

Department: Physical Geography

Research group: Hydrology, water resources and global change; and Computational geography

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Project description

PCR-GLOBWB (https://github.com/UU-Hydro/PCR-GLOBWB_model) is a global hydrology and water resources model being developed over the past two decades at the Department of Physical Geography. Currently we are the first one developing a 1 km resolution global hydrological model including its extension to a groundwater model (Verkaik et al., 2019, <https://meetingorganizer.copernicus.org/EGU2019/EGU2019-13397-2.pdf>).

In this work, we aim to further develop a 100 m resolution groundwater model. While running this model at this high resolution may still not be feasible for the global extent (e.g. due to limited computer power), we intent to develop an efficient toolbox for running a groundwater model for a limited region that can be selected and defined by users. The toolbox will facilitate to prepare and clip the global datasets used in PCR-GLOBWB to smaller extent model input files for any areas in the world; and use them for model runs at 100 m resolution. We also aim to equip the toolbox with some evaluation and visualization kits for conducting local assessment of groundwater-related problems (e.g. declining groundwater heads in megacities and irrigation areas).

Together with us, you will develop the toolbox in a python jupyter notebook. You will be involved in writing scientific publications resulting from this work. We will also explore the opportunity for you to present this work on scientific conferences (subject to funding).

Job requirement

We are looking for a student who has followed courses in hydrology and, preferably, know scientific programming, e.g. Python, R or Matlab. Knowledge of PCRaster or PCR-GLOBWB is not necessary.