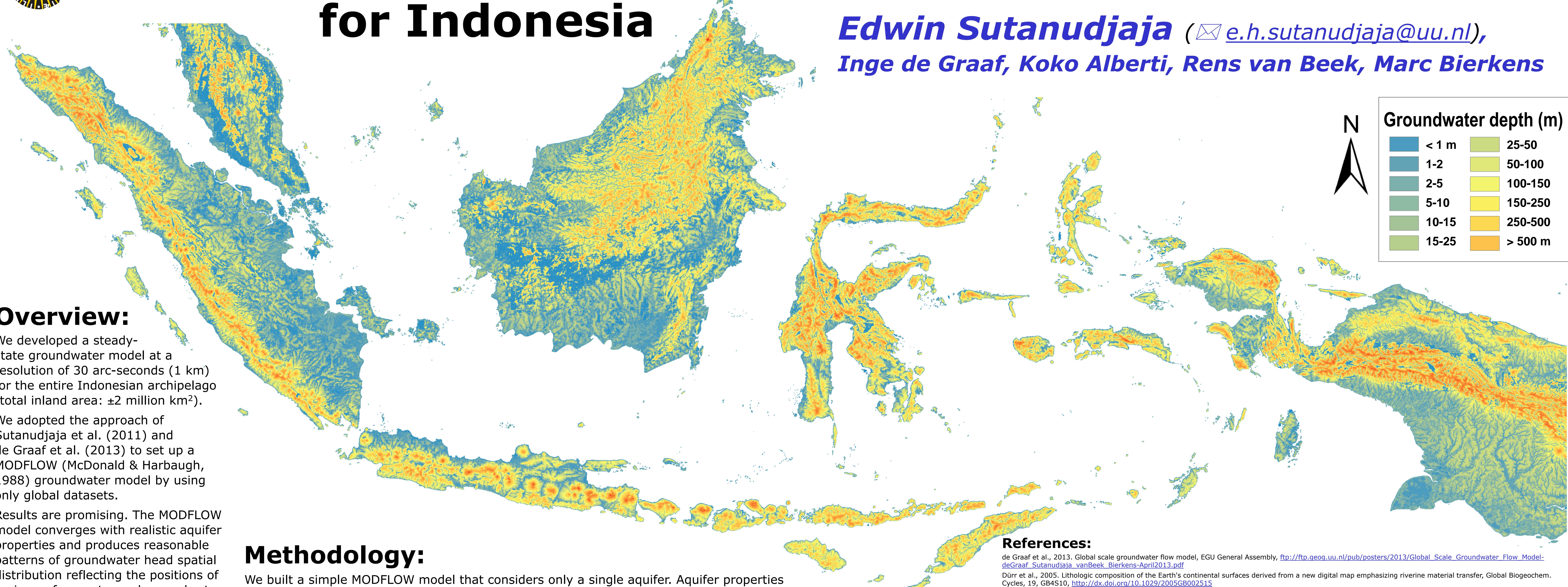


Developing a high resolution groundwater model for Indonesia

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Overview:

We developed a steady-state groundwater model at a resolution of 30 arc-seconds (1 km) for the entire Indonesian archipelago (total inland area: ± 2 million km 2).

We adopted the approach of Sutanudjaja et al. (2011) and de Graaf et al. (2013) to set up a MODFLOW (McDonald & Harbaugh, 1988) groundwater model by using only global datasets.

Results are promising. The MODFLOW model converges with realistic aquifer properties and produces reasonable patterns of groundwater head spatial distribution reflecting the positions of major surface water and groundwater bodies in the country.

The resulting groundwater depth map is shown on this poster.

Methodology:

We built a simple MODFLOW model that considers only a single aquifer. Aquifer properties were estimated from available global lithological maps (Dürr et al., 2005; Hartmann & Moosdorf, 2012) and a global permeability map (Gleeson et al., 2010). The MODFLOW model was forced with the average groundwater recharge and surface water levels derived from the global hydrological model PCR-GLOBWB (van Beek et al., 2011) that were obtained from recent simulations at 5 arc-minute (10 km) resolution (Sutanudjaja et al., 2013).

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