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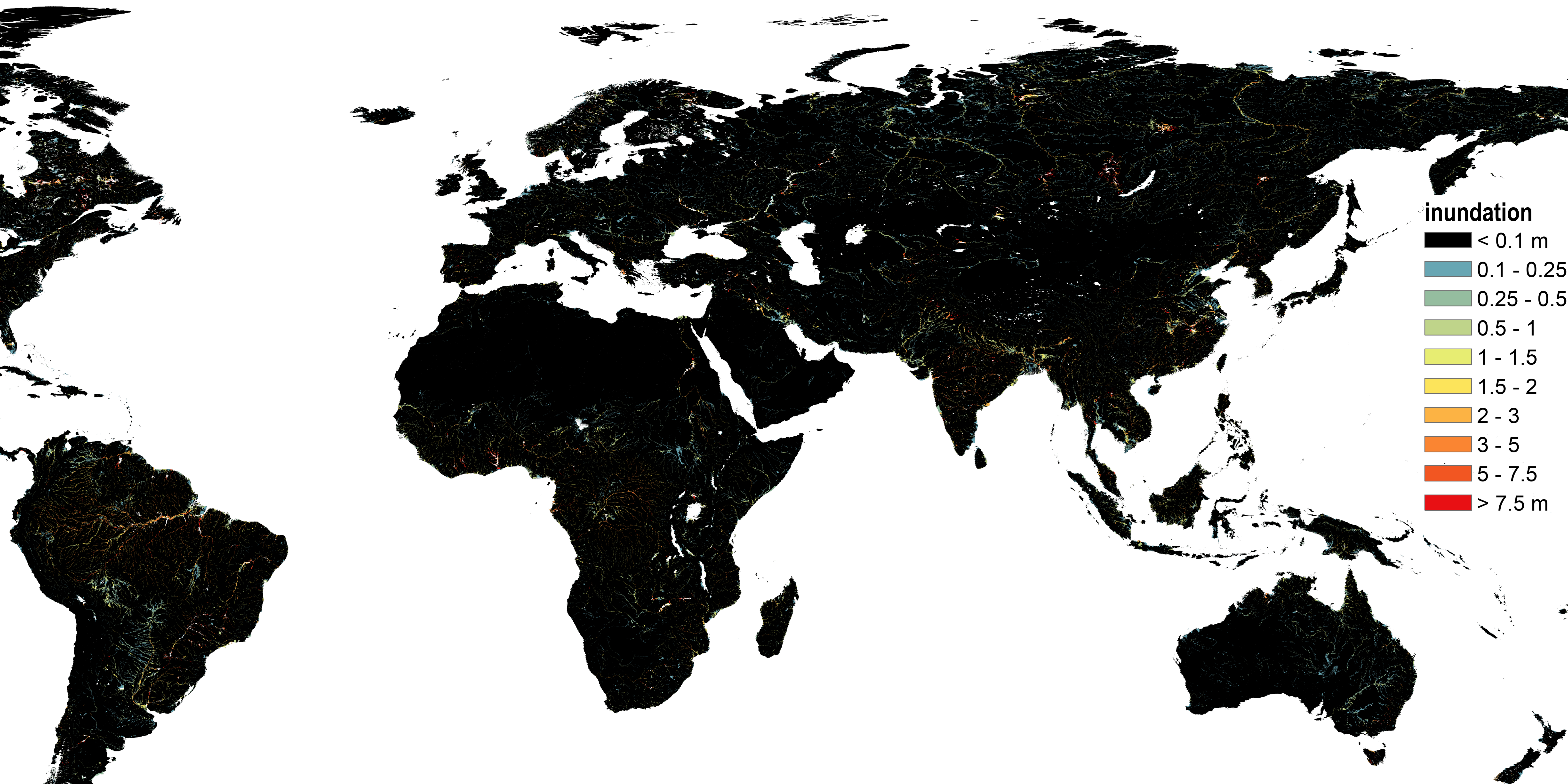
Overview

The Aqueduct Global Flood Analyzer, launched in 2015, is an open-access and free-of-charge web-based interactive platform which assesses and visualises current & future projection of river flood impacts across the globe. A key component in the Analyzer is a set of river flood inundation hazard maps derived from the global hydrological model PCR-GLOBWB. For the current version of the Analyzer (<http://floods.wri.org/#/>), the early generation of PCR-GLOBWB 1.0 was used and simulated at 30 arc-minute (~50 km at the equator) resolution.

In this presenting work, we update the Analyzer with the simulation results from the latest version of PCR-GLOBWB 2.0 (https://github.com/UU-Hydro/PCR-GLOBWB_model, Sutanudjaja et al., 2016, doi:10.5281/zenodo.60764) simulated at 5 arc-minute (~ 10 km). The model simulates daily hydrological and water resource fluxes and storages, including simulation of river overbank flooding.

The simulation was performed for the present day situation (from 1960) and future climate projections (until 2099) using the climate forcing created in the ISI-MIP project. From the simulated flood inundation volume time series, we then extract annual maxima for each cell, and fit these maxima to a Gumbel extreme value distribution. This allows us to derive flood volume maps of any hazard magnitude (ranging from 2-year to 1000-year flood events) and for any time periods (e.g. 1960-1999, 2010-2049, 2030-2069, and 2060-2099). The derived flood volumes (at 5 arc-minute resolution) are then spread over the high resolution terrain model using an updated GLOFRIS downscaling module (Winsemius et al., 2013, doi:10.5194/hess-17-1871-2013). This results in a set of high resolution hazard maps of flood inundation depth at 30 arc-second (~1 km). Together with other updates and new features, the resulting flood maps will be used in the next Aqueduct Global Flood Analyzer.

In this poster, we show the 100-year flood inundation depth (m above surface level) for the present situation.



Validation

We verified the PCR-GLOBWB simulation results to the discharge data from GRDC (<http://www.bafg.de/GRDC>). Some time series on the left compare the PCR-GLOBWB simulated discharge (blue) and GRDC observation data (red) for some major rivers.

Furthermore, to evaluate the GLOFRIS downscaling results, we validated the 1 km flood inundation extent map to available local studies/maps. As an example, the figure on the right compares the 100-year flood extent from this presenting global modeling approach to a local flood map with the same return period. The green areas in the figure indicate the agreement between both of them. Areas in blue show inundation extent suggested by our global study only (i.e. not identified by the local study), while red areas show the inundation extent based on the local map that cannot be captured by our global modeling approach.

