Evaluating floods in the Kabul River basin of Pakistan with the Soil and Water Assessment Tool (SWAT) model

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Objective
Our aim is to better understand the impact of flooding on public health in the Kabul River basin. We plan to use SWAT to model the concentration of E. coli in the surface water to enable fate and transport studies and scenario analysis.

Background
✓ 3.4 million people died out of 1.5 billion people worldwide who suffer from waterborne diseases (UNICEF/WHO 2009). Also in the Kabul River basin in Pakistan a large percentage of deaths is due to waterborne diseases.
✓ E. coli is relatively easy and cheap to measure indicator bacterium for waterborne pathogens.
✓ Kabul river floods every year and this makes the basin an ideal test case to study flooding impacts on E.coli concentration in surface water.

Outlook
This modelling study will provide quantitative proof of increased E.coli concentrations in surface water with flooding and enable assessment of major sources of water pollution.

Study area, E. coli sources and flow

Methodology

Validation E. coli concentrations in Kabul River

Present and future E. coli concentration

Scenario data
IPCC (SSPs / RCPs)

SWAT MODEL

E. coli concentration / River discharge

Log Discharge

Log Surface E.coli

Log Drinking E.coli

Weather & hydrological data

Input Data

Basin details

DEM

Streamflow network

Land use

Soil types

Slope

HRUs

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