

Investigating the impact associated with faecal indicator bacteria in urban floodwaters due to future socio-economic and climate changes

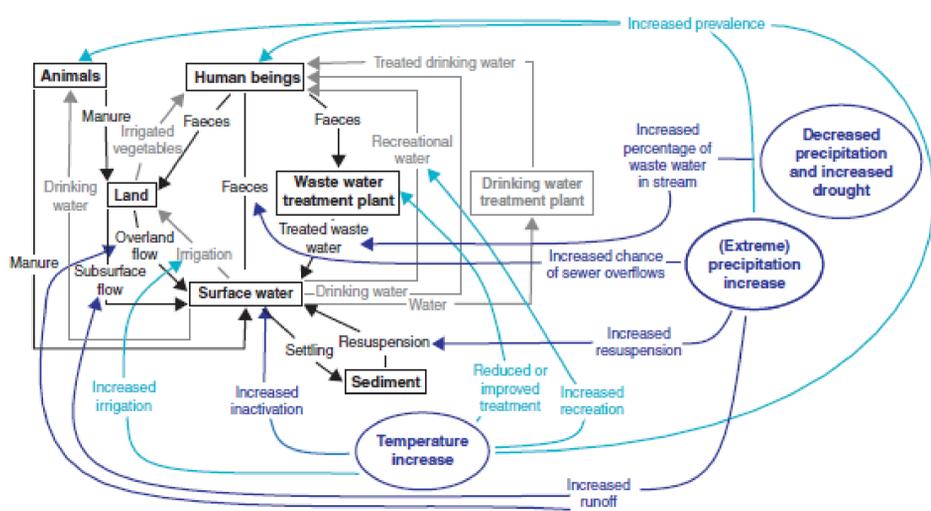
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1. Project summary

Aim: Investigate the impacts of CSO on public health risk, under future socio-economic and climate change scenarios.

Main objectives:

- ❑ Model a drainage system (coupled 1D and 2D model) with MIKE URBAN
- ❑ Model faecal indicator bacteria (FIB) using MIKE ECO lab
- ❑ Two future scenarios (2040's and 2090's) will be adopted for both shared socio-economic pathways (SPP's) and representative concentration pathways (RCP's)



(Hofstra, 2011)

2. Data

- ❑ **Calibration for hydrodynamic model**
 - Water level, flows, discharge, hydraulic head
- ❑ **FIB**
 - Escherichia coli, intestinal enterococci and Campylobacter
- ❑ **Geographical**
 - Digital elevation model, drainage/sewer network
- ❑ **Climate**
 - Temperature, rainfall, radiation
- ❑ **Socio – economic**
 - Population, land use, urbanisation and economic growth

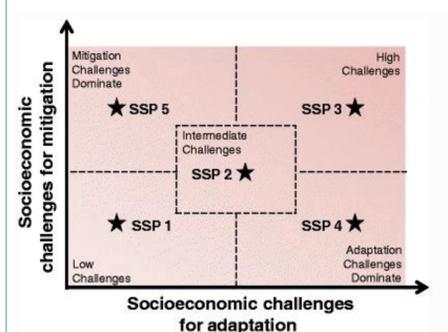
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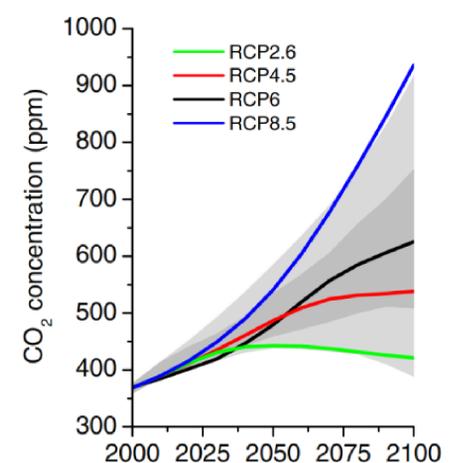
3. Scenarios and hypothesis

The scenarios are conceivable prospects about how the future may unfold. Based on five narratives, SPP's describe broad socio-economic trends that could shape our future (O'Neill et al., 2014).

New scenario matrix: S1-sustainable (SSP1 and RCP2.6) and S2-unsustainable (SSP4 and RCP8.5) will be created.



(Van Vuren et al., 2012)



- ❑ It is hypothesised that under the socio-economic and climate change scenarios FIB concentrations will be significantly altered
- ❑ S1- will very likely show a reduction to FIB concentrations.
- ❑ S2- will very likely show an increase to FIB concentrations
- ❑ Precipitation intensification will amplify flooding. Yet, it is unclear how this will contribute to FIB transport in an urban environment, as dilution and decay rates are incredibly complicated
- ❑ It is very likely that socio-economic scenarios will contribute more to FIB variations than climate change

4. Future work

- ❑ Develop a suitable case study
- ❑ Expand objectives and scenario matrix
- ❑ Build flood model using MIKE packages
- ❑ Establish data calibration methods (using a physical model)
- ❑ Analyse data



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