Bathing in urban rivers
Predicting water quality for early warning at bathing sides
Bathing in urban rivers is smart
Bathing in urban rivers means risks from urban drainage

**Berlin combined sewer system**
- 53 km² impervious surface
- 1.5 Mio Inhabitants
- 179 CSO discharge points
- 30 - 40 events per year
- CSO Volume: 7 Mio m³/a

**Berlin separate sewer system**
- 53 km² impervious surface
- 2 Mio Inhabitants
- 47.6 Mio m³/a
- **100-120** events a year

**WWTP**
- 234 Mio m³/a
- UV disinfection dry weather
- Bypass stormwater

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E-Coli pollution after rain event at river bathing sites
Main effects:
- Precipitation (P) [mm] (5min)
- River flow (Q) [m³/s] (15min)
- non-disinfected WWTP discharges (WWTP) [m³/s] (30 min)

Transformations:
- Log₁₀ transformation of E.coli concentrations
- Log transformation of precipitation data

Interactions:
- Flow and WWTP + flow and precipitation

Software:
- R, rstanarm-package for applied Bayesian regression modelling

General form of the used regression models
\[ \log_{10}(E.coli) \sim N\left( Q \left( \log(P) + WWTP \right), \sigma^2 \right) \]

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Regression model can be validated

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Early-warning system is only based on available data and is now communicated!

www.badegewaesser-berlin.de
➢ Use city data makes life in urban areas smarter!

➢ City data means cooperation between city partners….

➢ Statistical models can be used instead of complexe ones

➢ Risk communication to citizen is important!