UNIKASSEL
VERSITÄT

Influence of urban infrastructure on headwater streams

first insights into water quantity and quality measurements in two rural areas

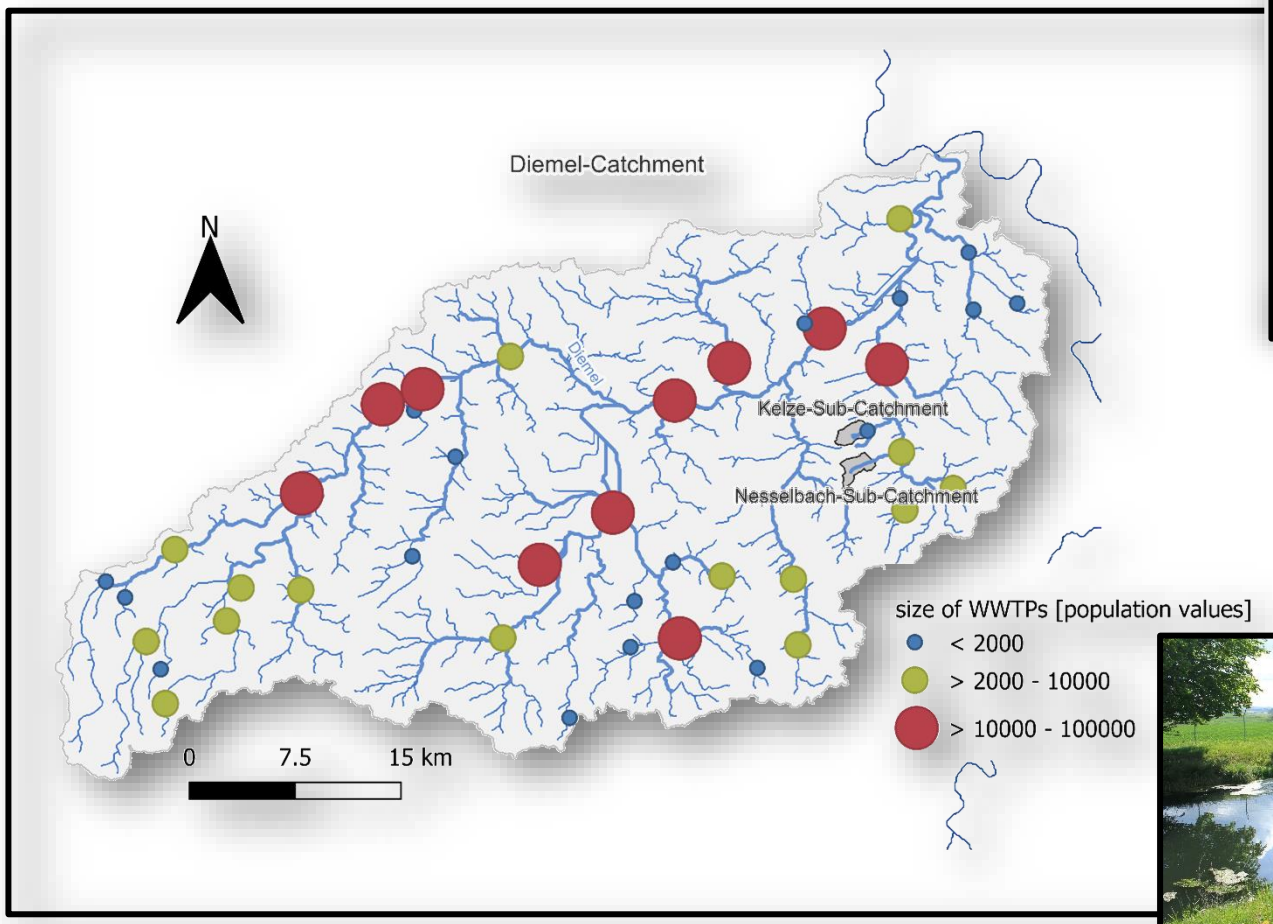
EGU session HS2.3.1 - Water quality at the catchment scale: measuring and modelling of nutrients, sediment and eutrophication impacts

Caroline Spill, Lukas Ditzel and Matthias Gassmann

Faculty of Civil- and Environmental Engineering
Department of Hydrology and Substance Balance
University of Kassel

Central research question

How does a rural settlement and its infrastructure influence streams in headwater catchments?

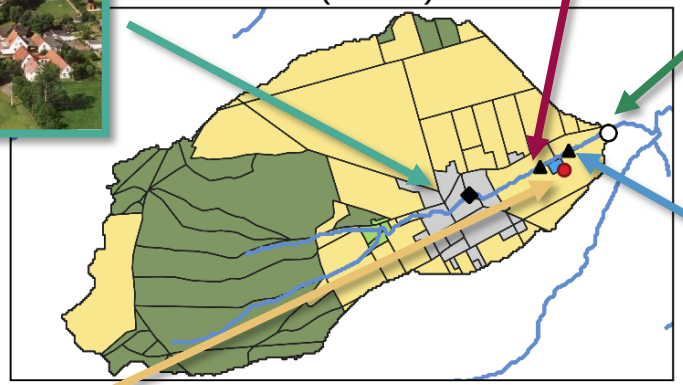


Study area

measurement setup for high frequency monitoring

site A (Kelze)

site B (N



s::can probe (*NO3,Turbidity,Temp),* **preasure probe, conductivity probe** } 5 minute

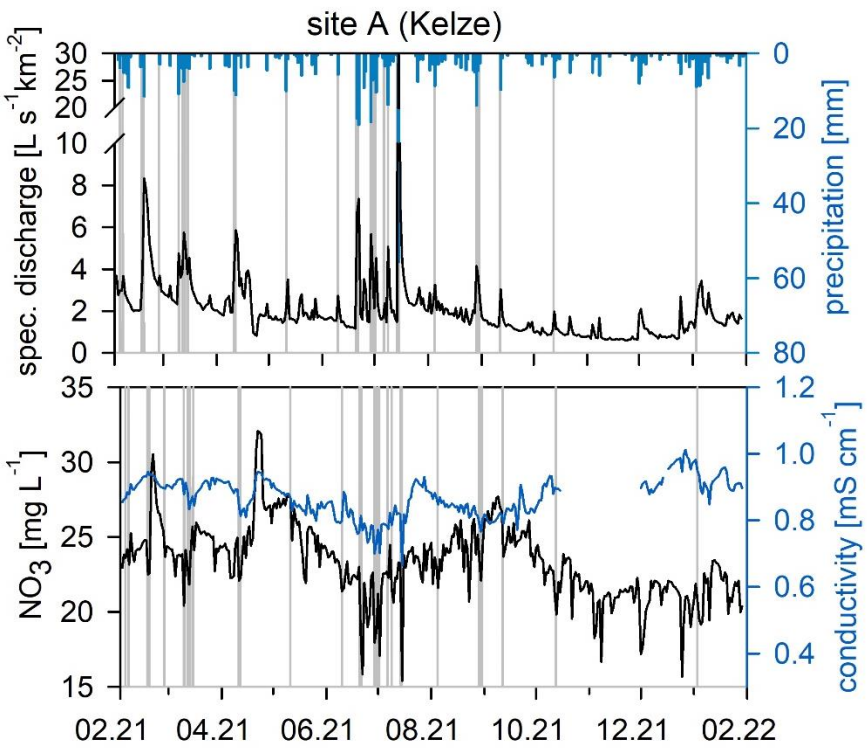
Autosampler (*NO2, NH4, totP, oPO4, cations, anions, water isotopes***)** } during events + grap samples

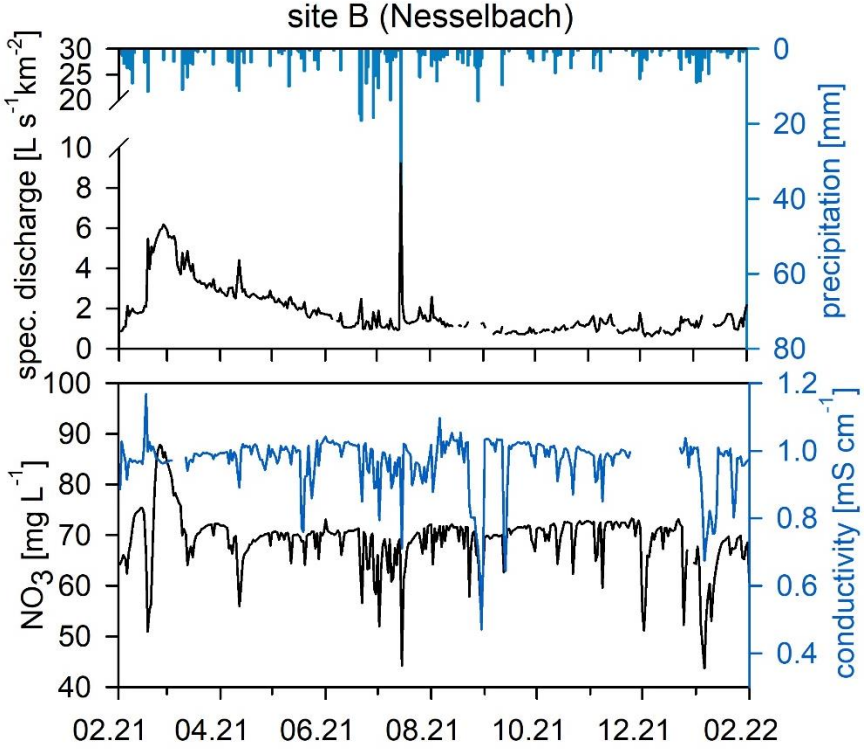
UNIKASSEL VERSITÄT

*Chapin et al., 2014, Robust, low-cost data loggers for stream temperature, flow intermittency, and relative conductivity monitoring

First Results

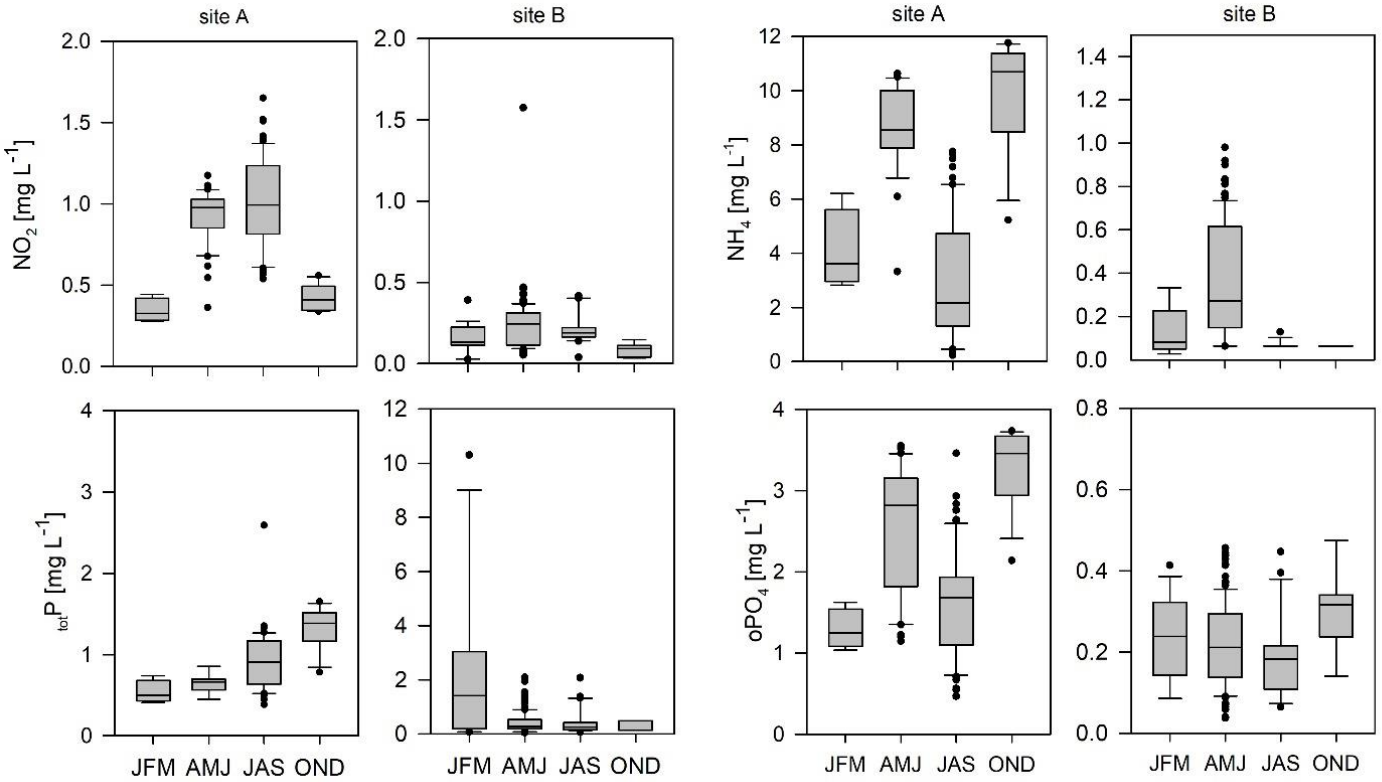
site A is strongly influenced by WWTP
- higher **discharge peaks**
- dilution of **Nitrate**
- less decrease of **conductivity**



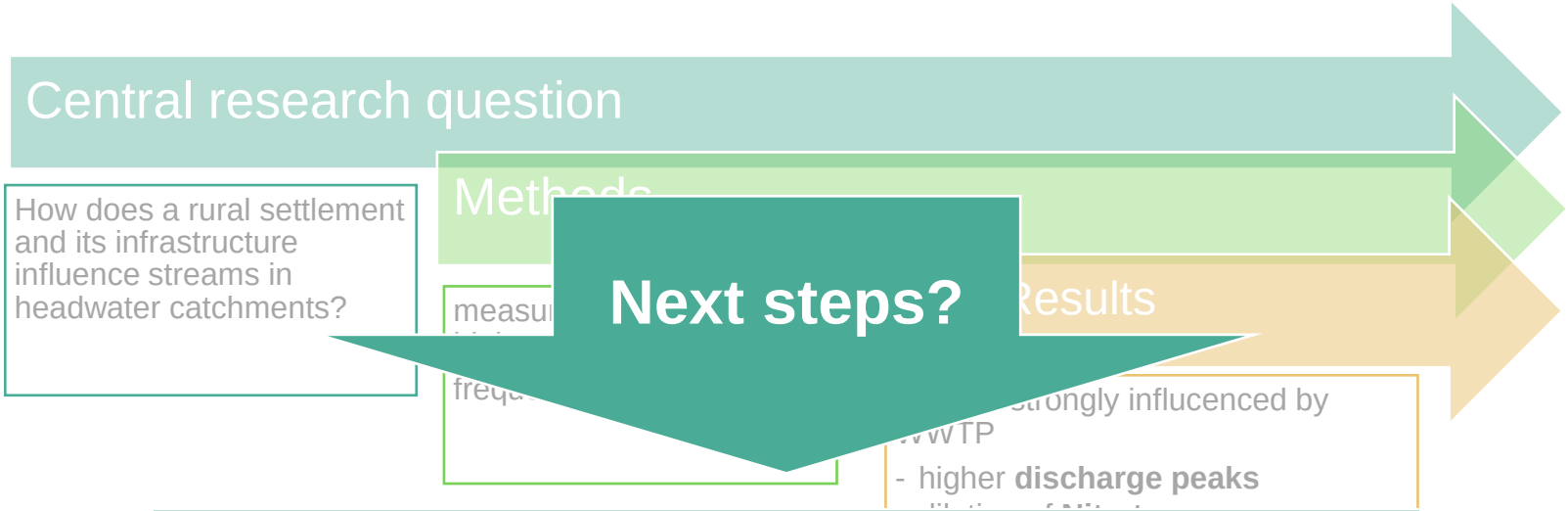


First Results

First low frequency data from automatic sampler



JFM – January, February, March
AMJ – April, May, June
JAS – July, August, September
OND – October, November, December



- find out hydrological and biochemical drivers for nutrient exports within the catchment and the WWTP
  - statistical analyses of data (e.g. cross correlation)
  - single event analysis (e.g. HI-Analysis)
  - ….
- Model of the catchment with ZINAgriTra and Implementation of a simple WWTP model