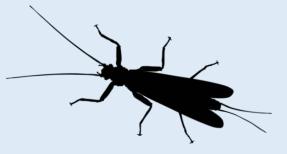
Climate change induced low flow in perennial streams

Are there measures to mitigate the effects on macroinvertebrates?

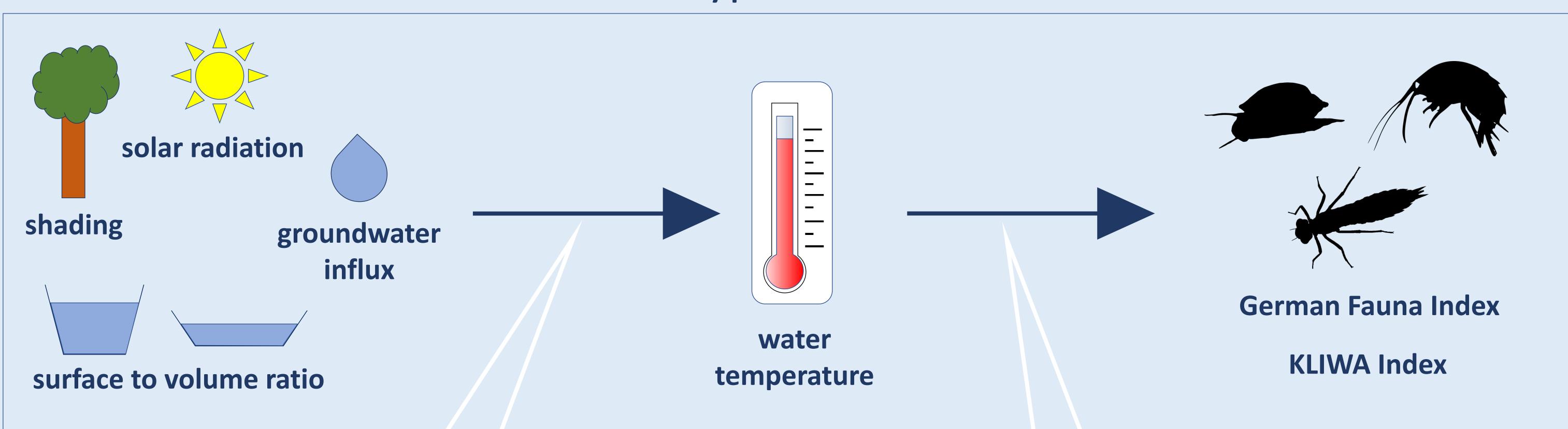
Hannah-Marie Stappert¹, Jochem Kail¹, Daniel Hering¹



Methods

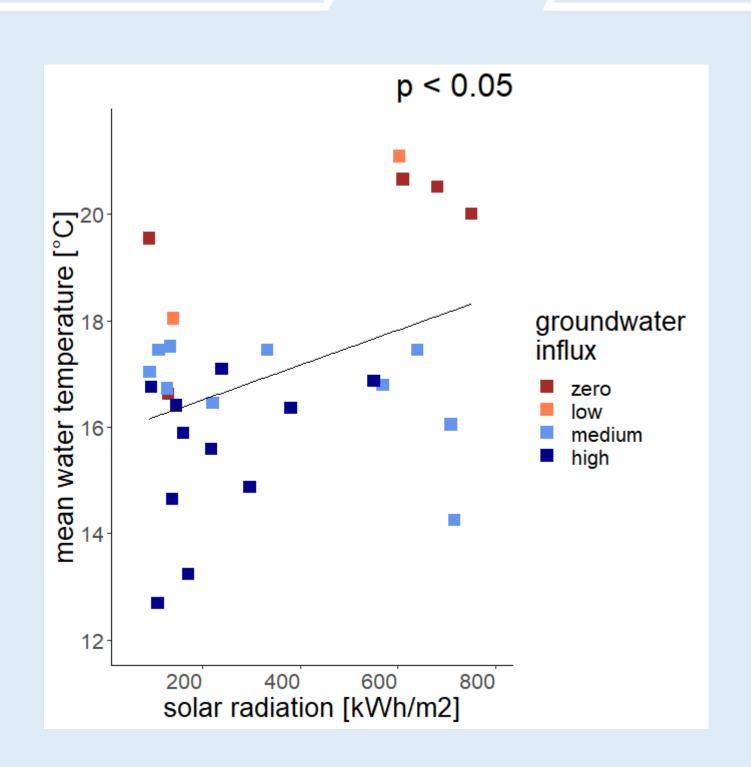
- 34 sampling sites in sand-bed streams (type 14) located in a lowland region in Germany
- Solar radiation on water surface calculated via drone images implementing shading
- Representative stream cross-sections measured to calculate surface to volume ratio
- Groundwater influx estimated based on expert knowledge; will be modelled in the future
- Water temperature measured every 20 minutes in summer prior to macroinvertebrate sampling
- Macroinvertebrates sampled in late summer 2022, directly after three months of a heavy drought, via multi habitat sampling

Hypotheses

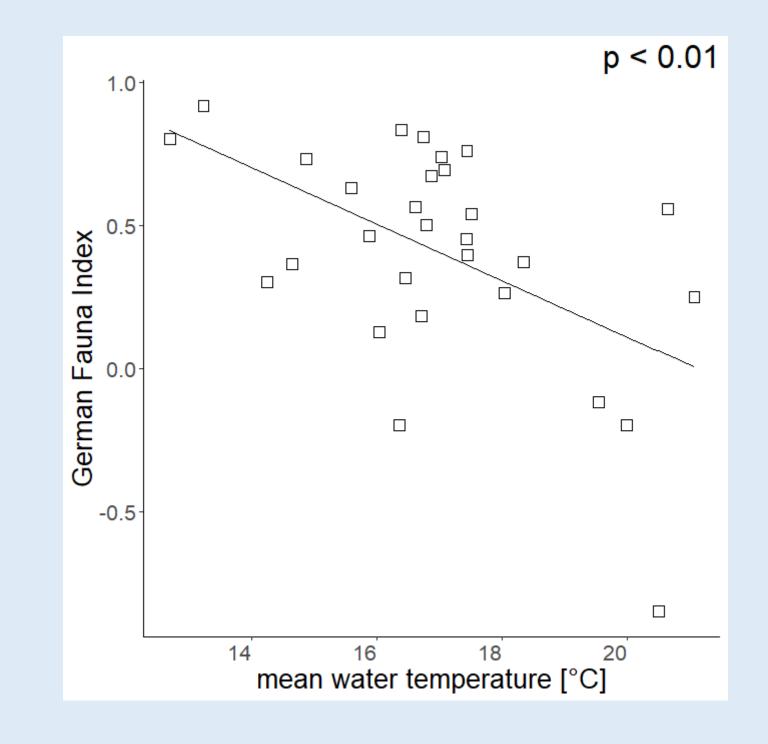


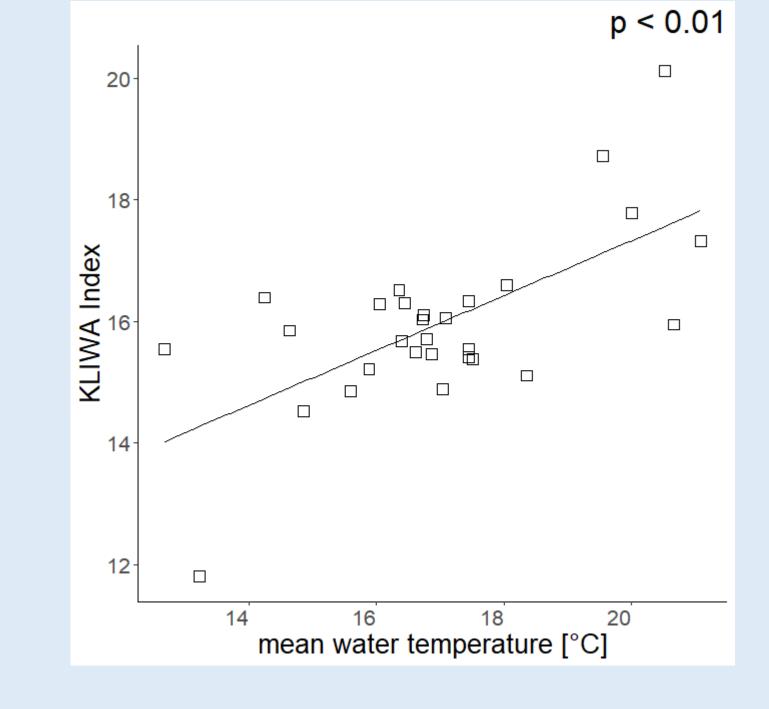
- Shading and small surface to volume ratio reduce water temperature in summer by reducing the amount of solar radiation reaching the water surface
- High groundwater influx reduces water temperature in summer
- Increase of water temperature leads to changes of macroinvertebrate community traits
- Lower German Fauna Index and higher KLIWA Index

Results



- Reduced solar radiation (by shading) and high groundwater influx reduce mean water temperature
- Surface to volume ratio has no effect





• Higher mean water temperature leads to lower German Fauna Index and higher KLIWA Index

Measures that

- decrease solar radiation input by shading
- increase groundwater influx ...

Conclusion

... decrease
water
temperature ...

... and may help to mitigate climate change effects on macroinvertebrate communities

Reference

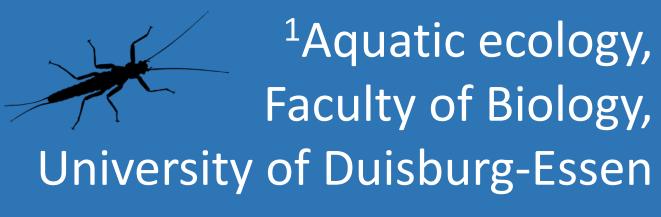
https://www.phylopic.org/













Open-Minded

