Our experiences with reproducible research in hydrology

JAN SEIBERT & ILJA VAN MEERVELD

UZH-GIUZ – H2K
Research Flow

Field work for data collection
Can field measurements be reproduced?

No man ever steps in the same river twice, for it's not the same river and he's not the same man.

Heraclitus (~500 BC)

Catchments change,
Initial conditions change,
Boundary conditions change,
Panta rhei (everything flows)
Can field measurement methods be reproduced?

- **Grab sample**
- **Streamflow - Rating curve**

From: https://en.wikipedia.org/wiki/Environmental_monitoring
Can raw data handling be reproduced?

Error removal
Gap filling

...
Can model code be reproduced?

"I think you should be more explicit here in step two."

Sidney Harris, November–December 1977
Can model code be reproduced?

Example
Soil routine of HBV model

\[
\frac{\text{recharge}}{\text{P}} = \left( \frac{S_{sm}}{F_C} \right)^\beta
\]

Fraction of rain or snowmelt

Soil moisture [mm]

0

1

FC

to soil moisture storage

groundwater recharge

Example
Soil routine of HBV model
Can a hydrology study be reproduced?

No, but it should be!!!

We should aim for reproducibility where possible

Old studies
Documentation, supplementary material