

Citizen observers in hydrology - Experiences from the CrowdWater project

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Zurich** ^{UZH}





On the following slides we compiled information about CrowdWater activities, but you can also skip the slides and jump directly to the action points below:

- Go and get the app 😊 (Search for CrowdWater, Spotteron in your app store)
- Play the CrowdWater game: <https://crowdwater.ch/en/crowdwater-game/>
- Watch the PhD seminars by Barbara Strobl and Simon Etter on our Youtube channel, <https://www.youtube.com/channel/UC088v9paXZyJ9TcRFh7oNYg>)
- Sign up for our Open Online Course about CrowdWater (in German, https://edu-exchange.uzh.ch/courses/course-v1:UZH+Crowdwater+2019_T1/about)
- Spread the word about our two new PhD positions, applications still welcome (https://crowdwater.ch/wp-content/uploads/2020/04/PhD_announcement_CrowdWater2020_DE.pdf)

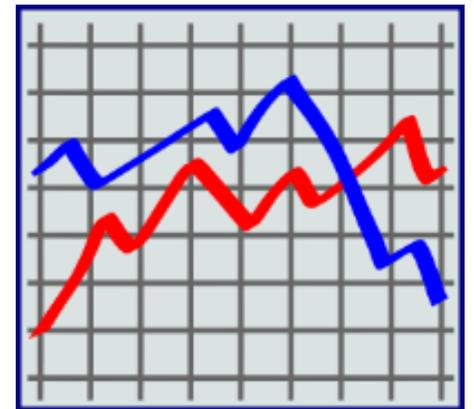
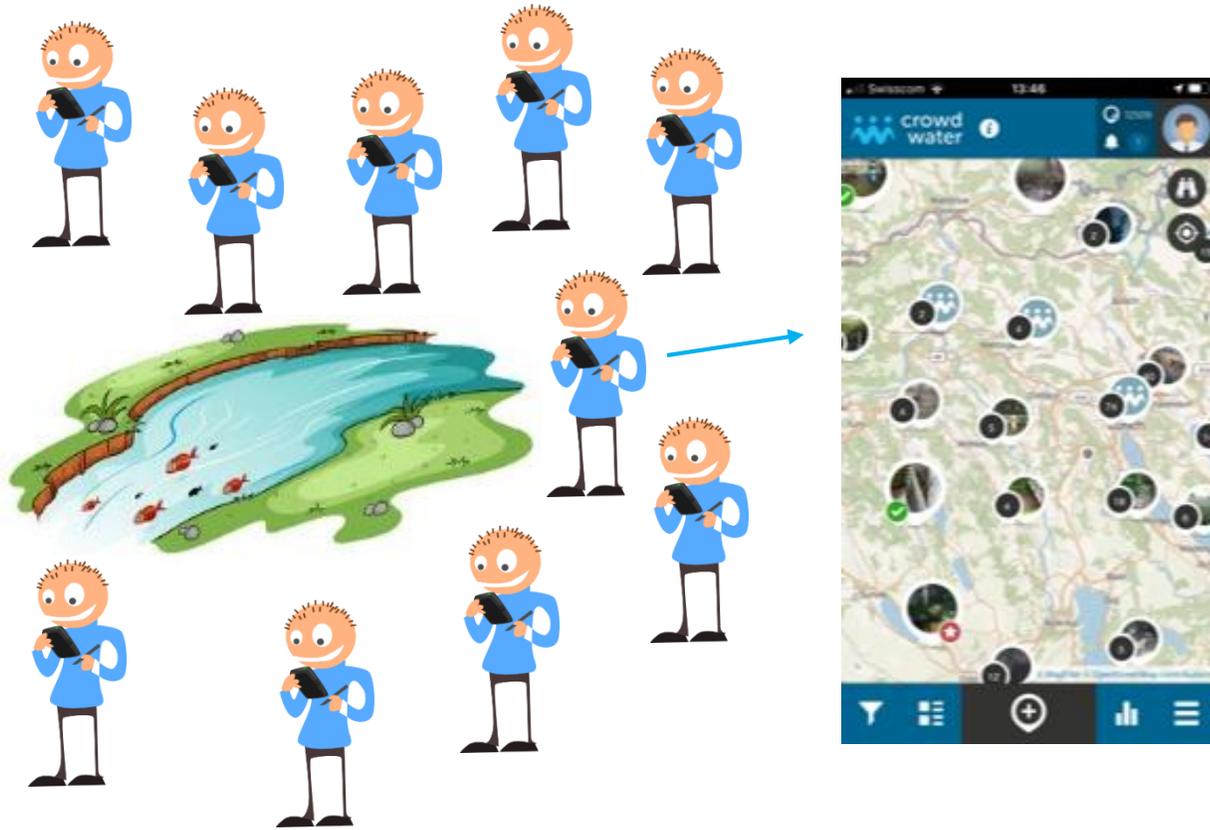
<http://www.crowdwater.ch>





Vision:

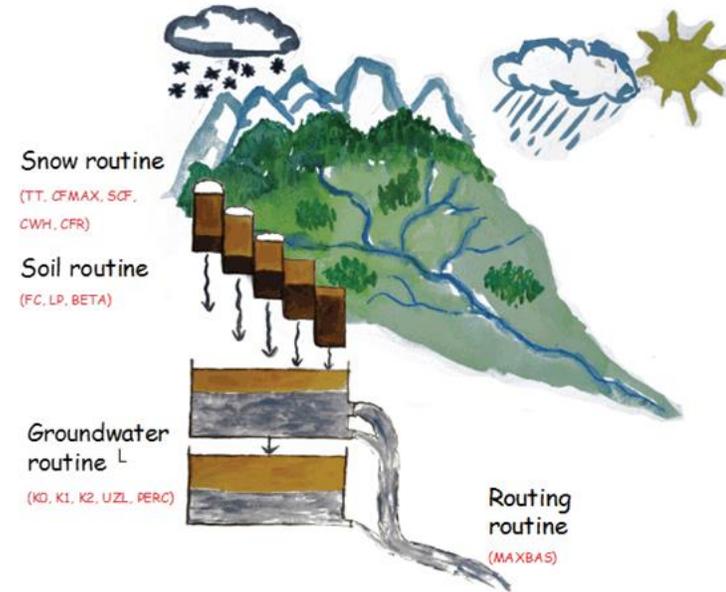
Scalable approach based on smartphone app





CrowdWater :

Evaluate the potential of crowd-based data for hydrological modelling



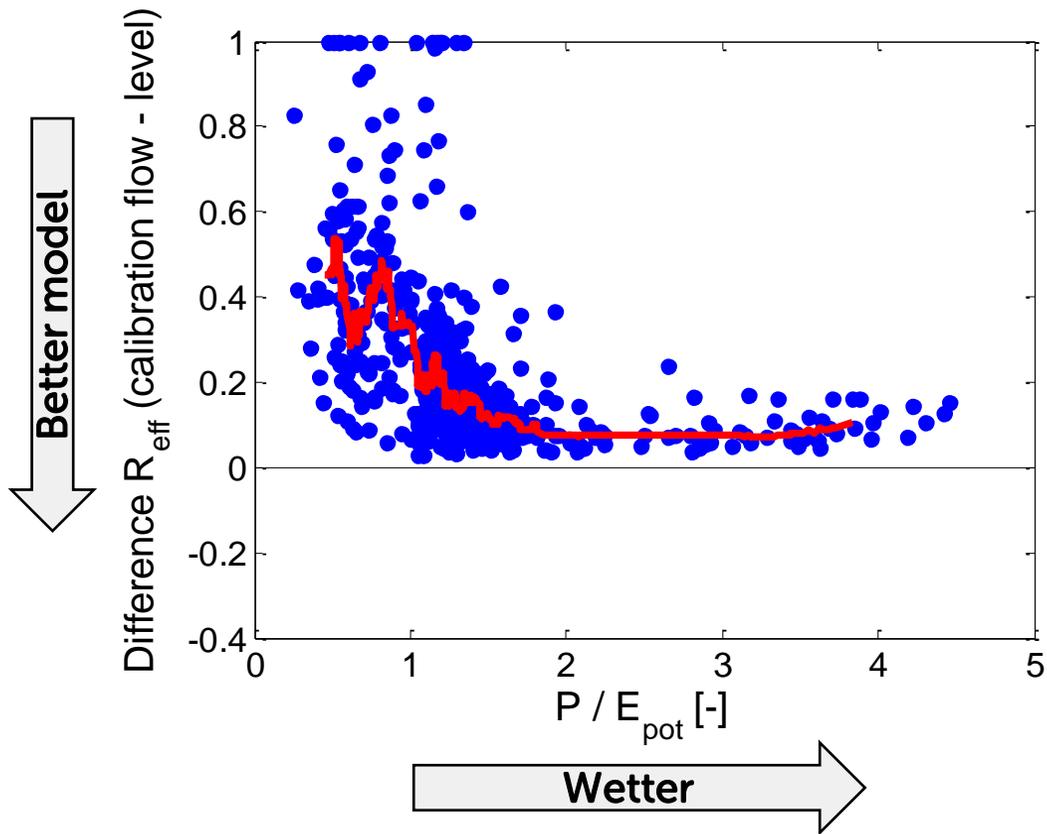
What can be observed by the 'crowd' (citizen scientists)?

At which accuracy?

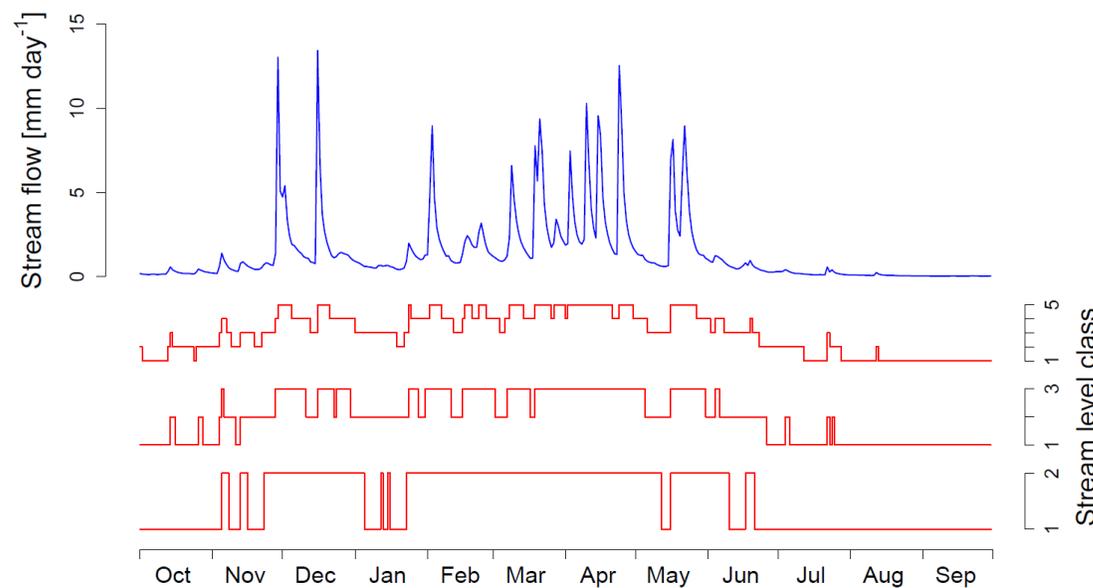
Which data would be most informative?

Value of data for modelling?

As shown at previous EGU meetings, water level (classes) are surprisingly informative, especially for humid catchments. Two plots as a reminder, for details please see the two papers.

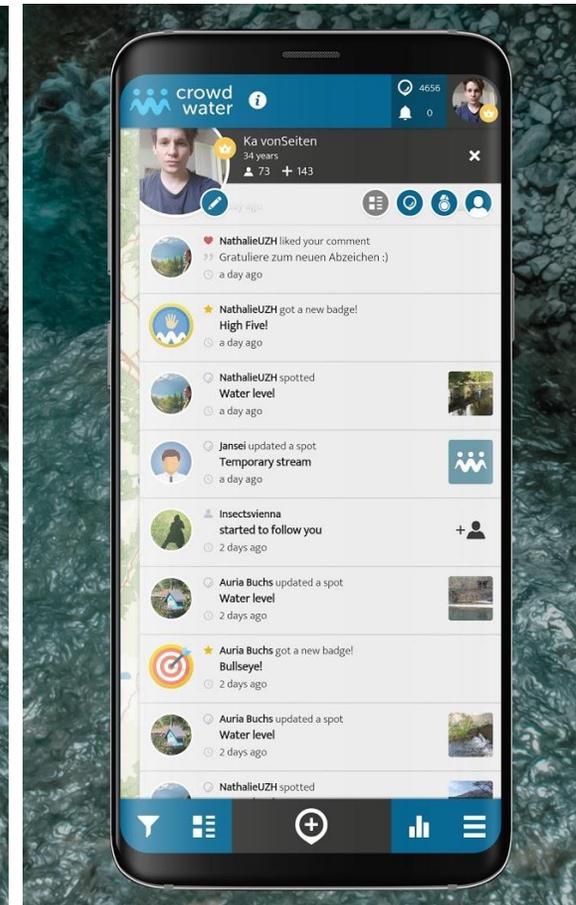
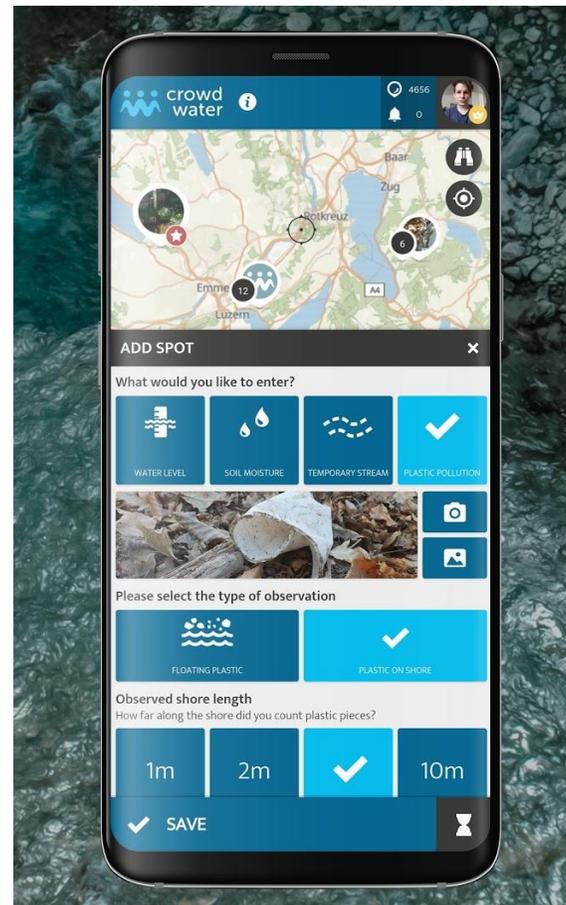
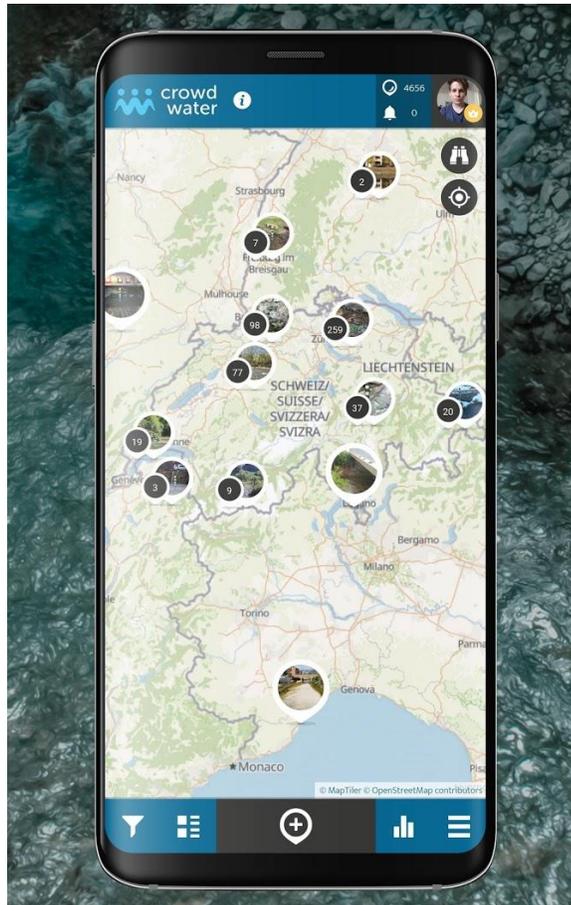


[Seibert and Vis, 2016, Hydrological Processes](#)

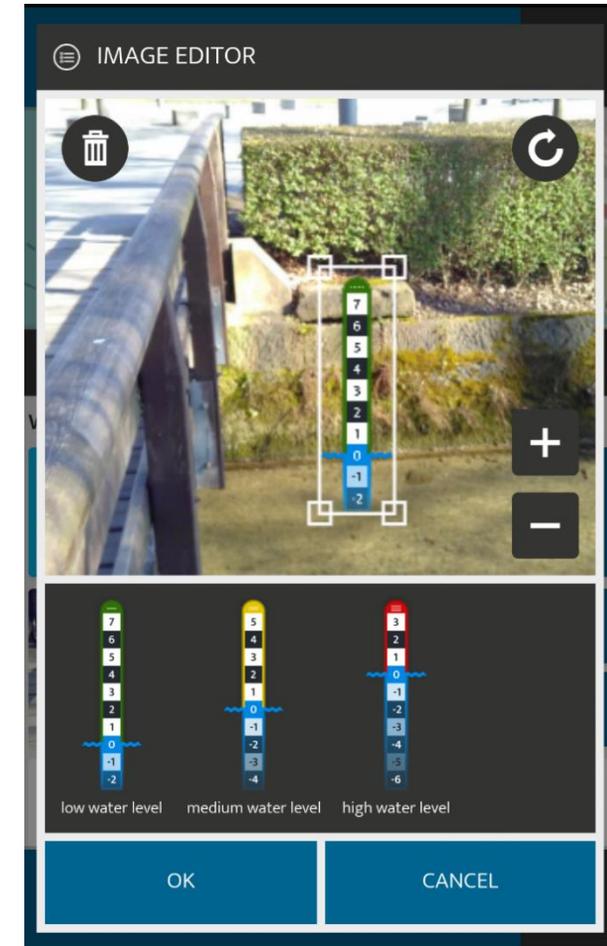


[van Meerveld et al., 2017, HESS](#)

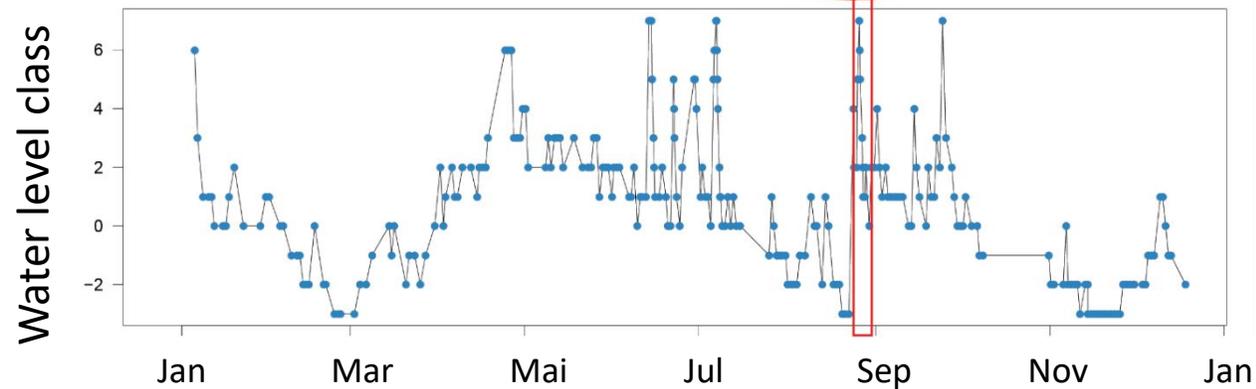
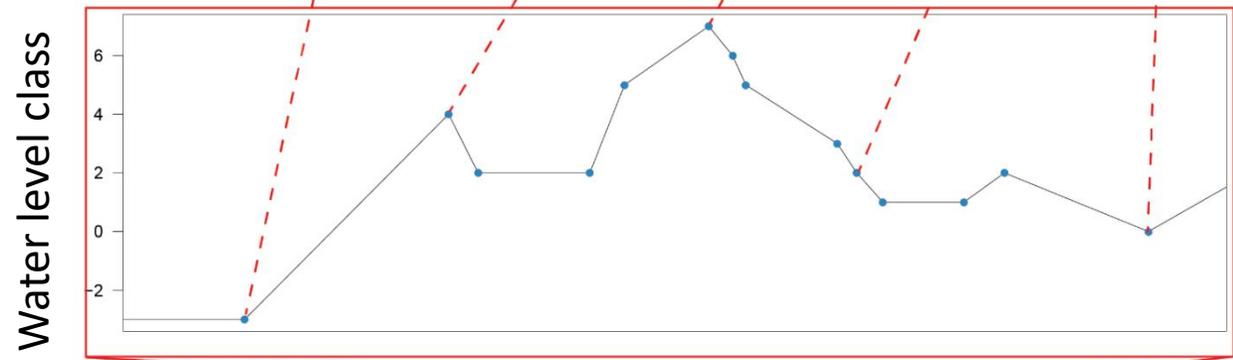
The CrowdWater | SPOTTERON App



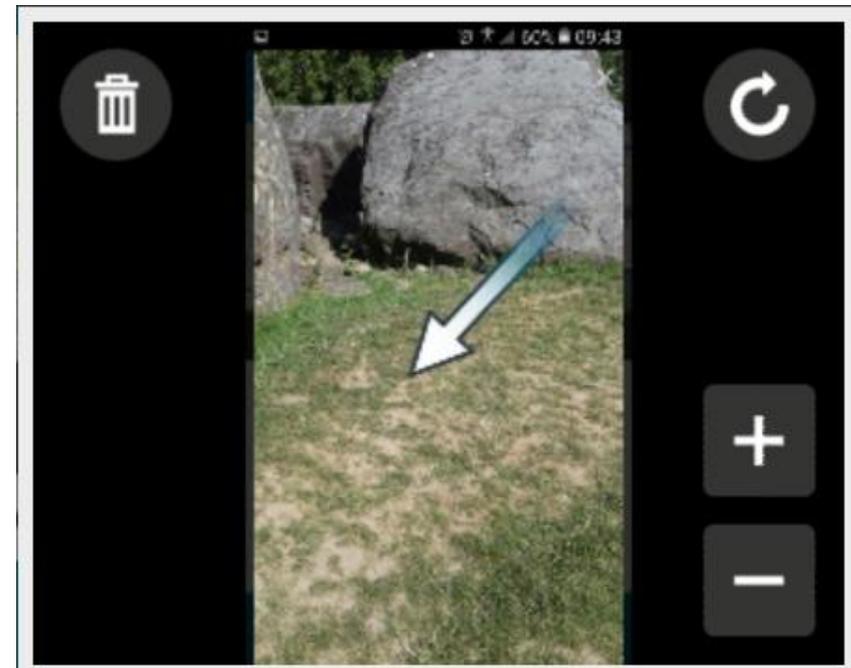
CrowdWater app: Water levels classes



Example time series



App: Soil moisture



[Rinderer et al., 2012,](#)
[Hydrological Processes](#)

App: Temporary streams

What do you observe?

Estimate the current flow condition of the temporary stream:



DRY STREAMBED



DAMP / WET
STREAMBED



ISOLATED POOLS



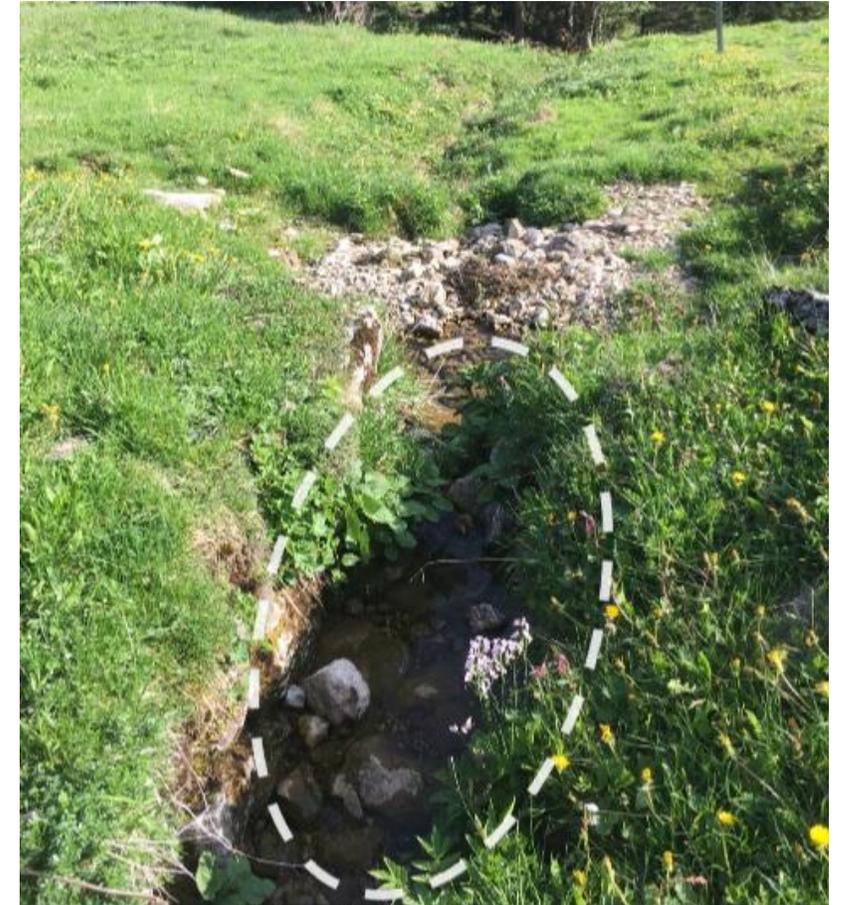
STANDING WATER



TRICKLING WATER



FLOWING



App: Plastic pollution

Please select the type of observation



FLOATING PLASTIC



PLASTIC ON SHORE

Did you see any plastic?

How many plastic pieces did you count during your stated time and over the stated width of the river?



NO PLASTIC



1-2 PIECES



3-5 PIECES



6-10 PIECES



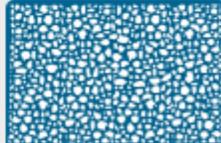
11-20 PIECES



21-100 PIECES



100+ PIECES

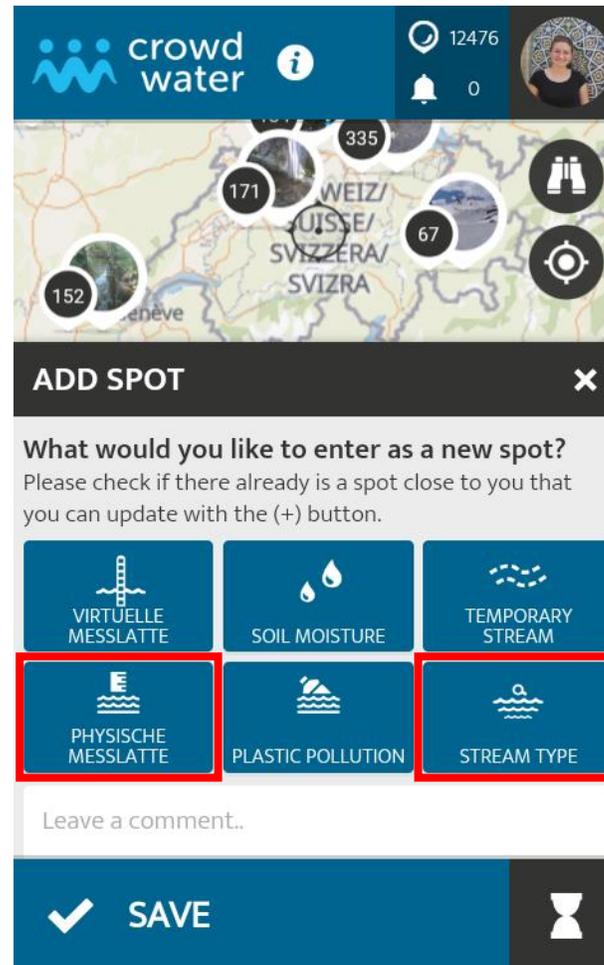


COVERED
ENTIRELY

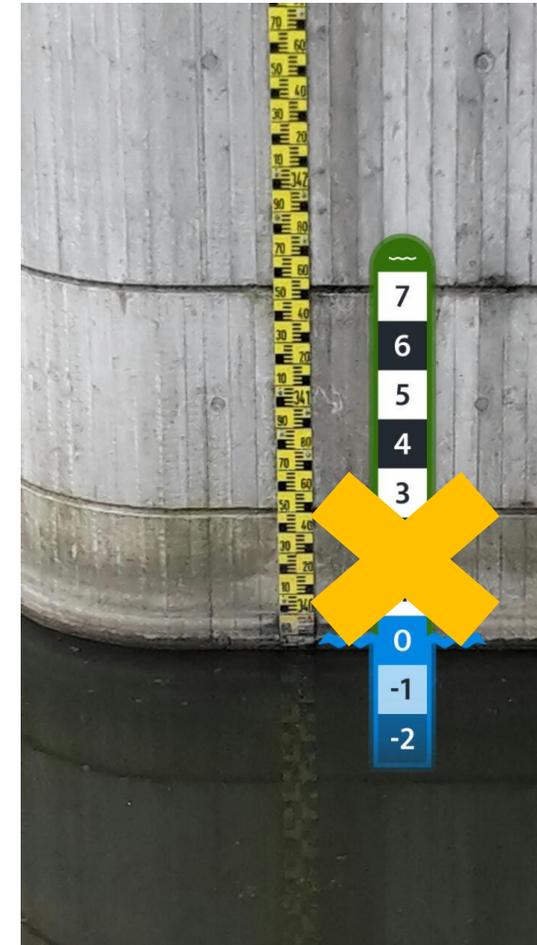
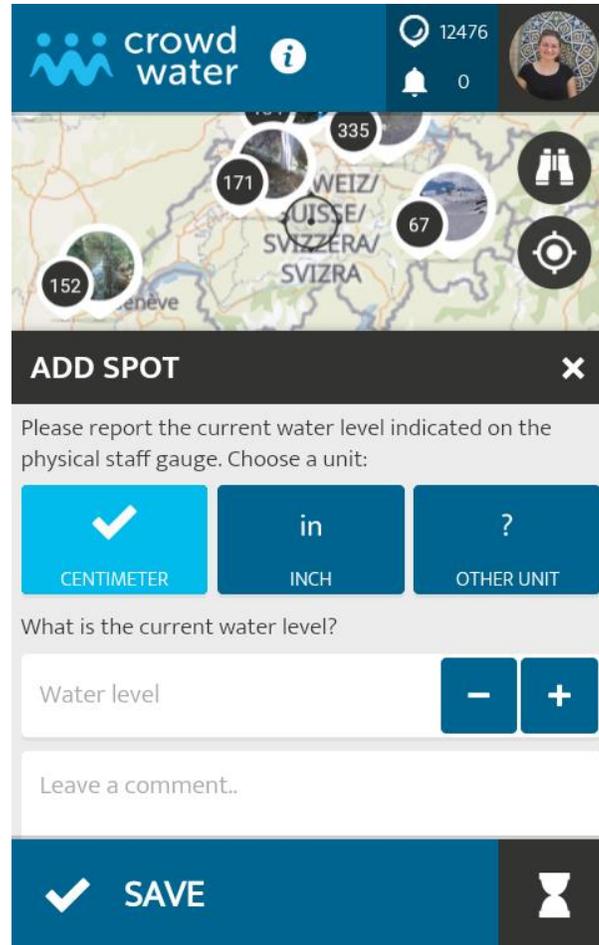


New: two more categories

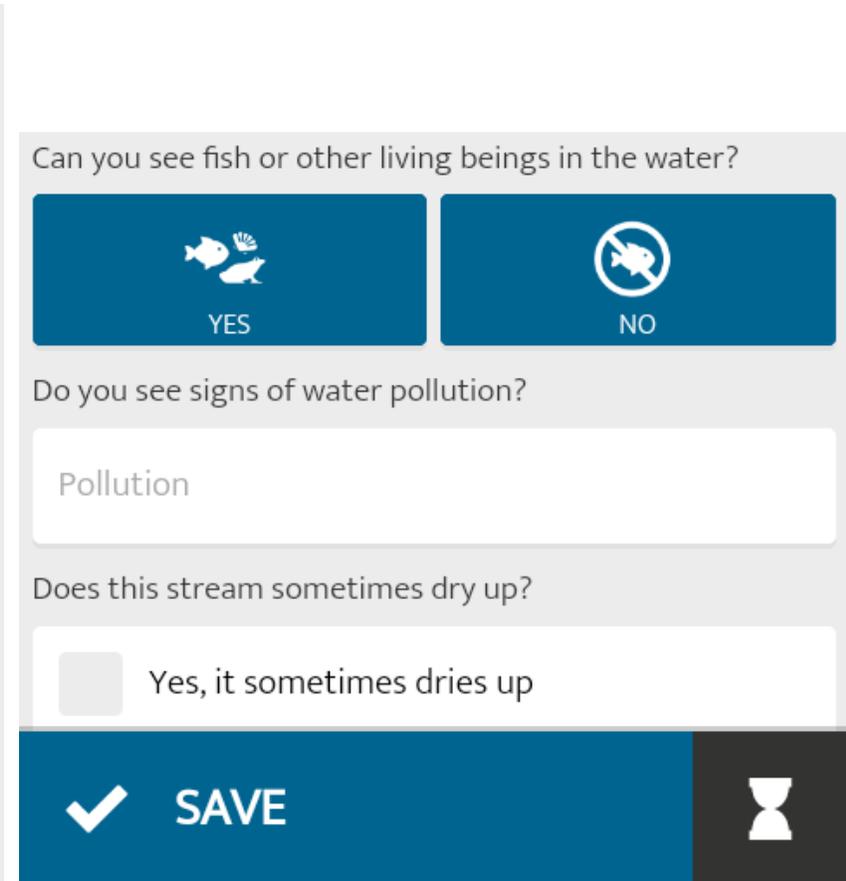
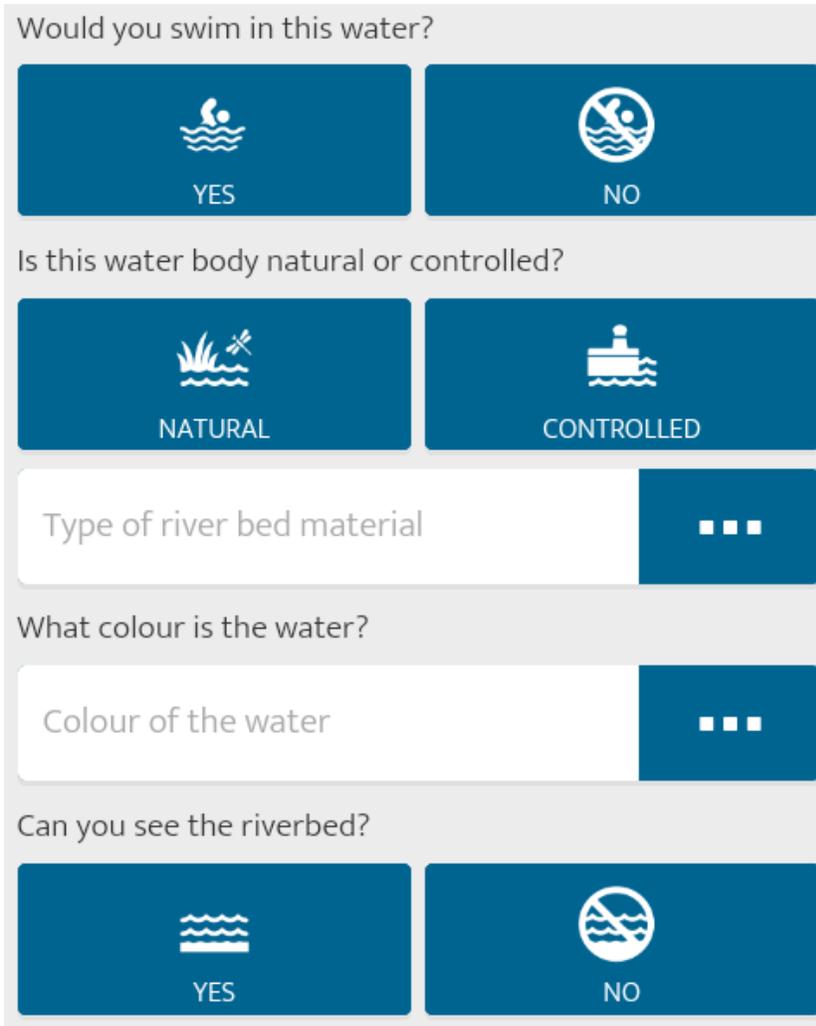
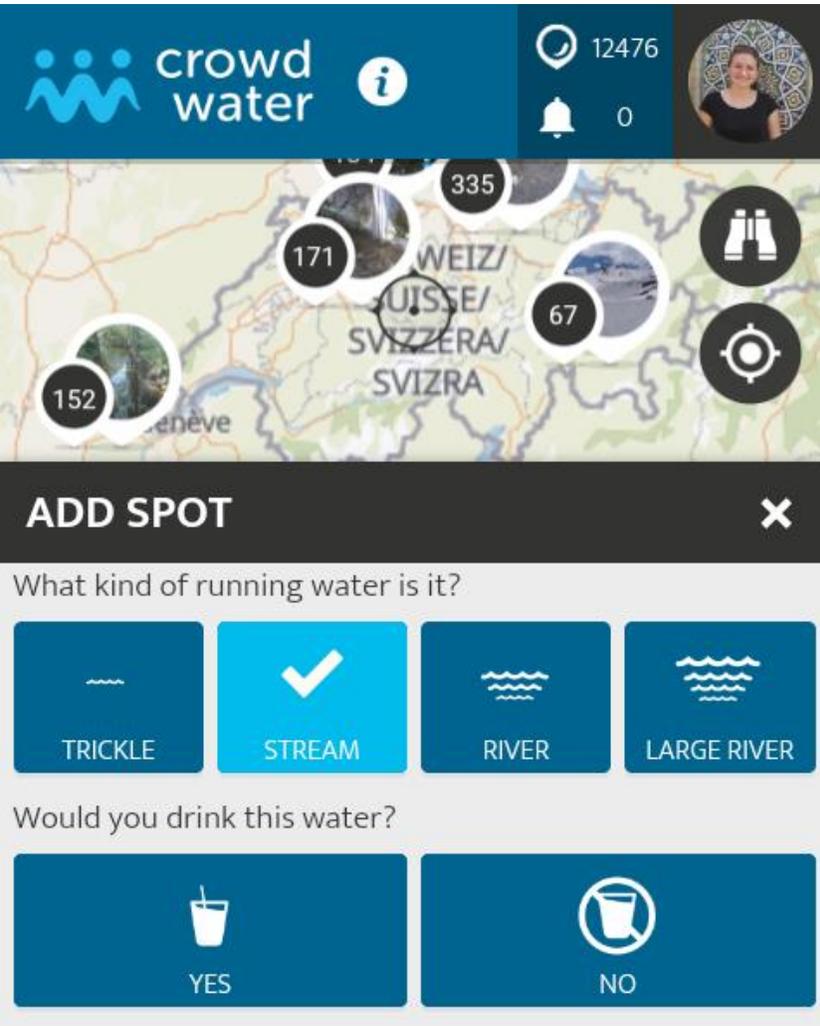
NEW
April 2020

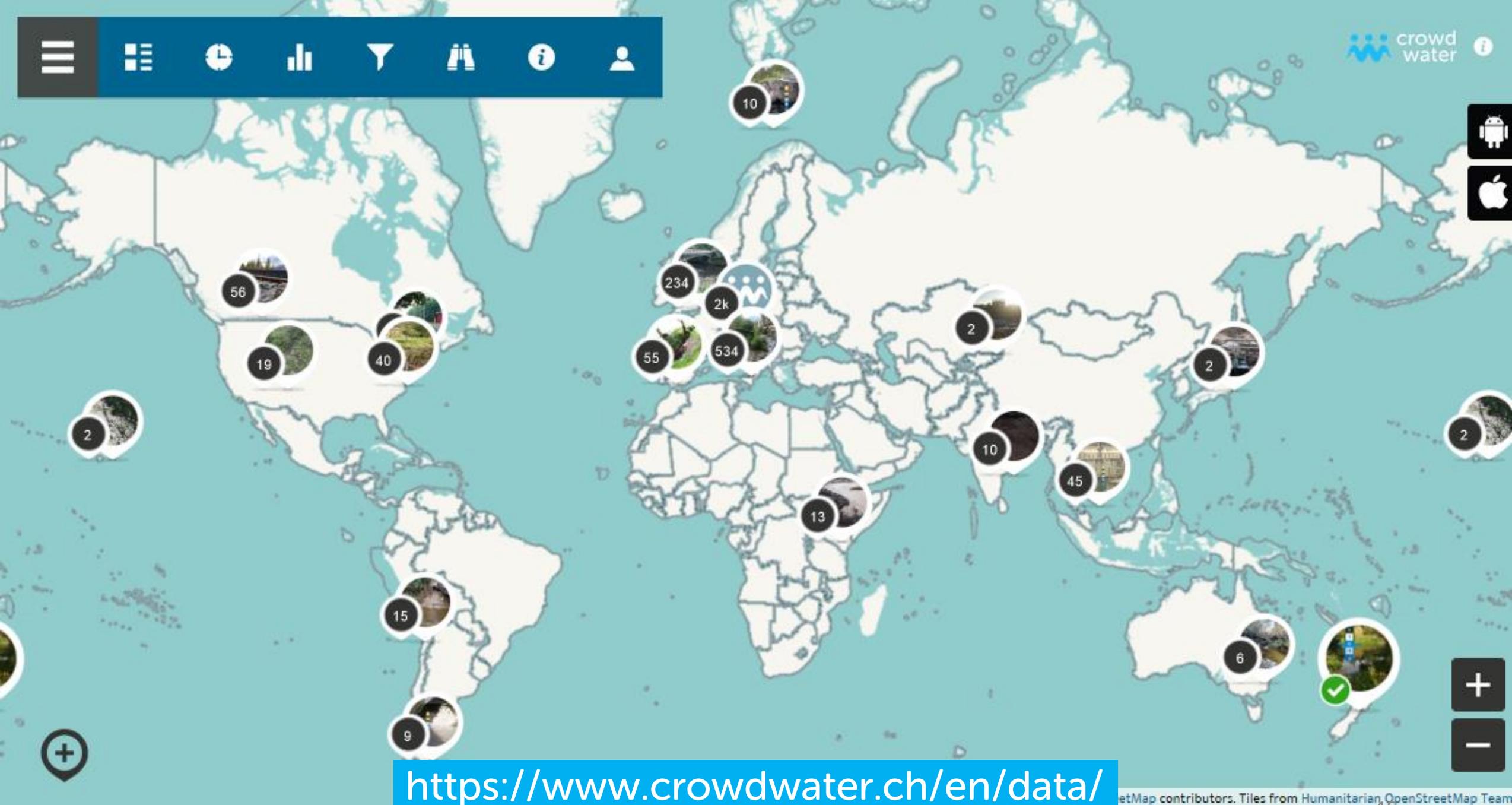


New: Physical staff gauge



New: Stream type





<https://www.crowdwater.ch/en/data/>



Some of our publications



Virtual staff gauge for crowd-based observations



Seibert, J., Strobl, B., Etter, S., Hummer, P., van Meerveld, H.J.: Virtual staff gauges for crowd-based stream level observations, *Front. Earth Sci. – Hydrosphere*, <https://doi.org/10.3389/feart.2019.00070>, 2019.



Crowd-based water level classes are informative



Etter, S., Strobl, B., Seibert, J., & van Meerveld, H. J.: Value of crowd-based water level class observations for hydrological model calibration. *Water Resources Research*, 56, e2019WR026108.

<https://doi.org/10.1029/2019WR026108>, 2020



Data quality control based on an online game



Strobl, B., Etter, S., van Meerveld, I., Seibert, J.: The CrowdWater game: A playful way to improve the accuracy of crowdsourced water level class data – PLoS One, <https://doi.org/10.1371/journal.pone.0222579>, 2019

<https://crowdwater.ch/en/crowdwater-game/>



Conclusions

- Simple approaches can provide useful data
- Value of data can be evaluated
- Crowd-based water-level class observations can be informative
- A game can help for data quality control

<http://www.crowdwater.ch>





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Hydrological Citizen Science



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