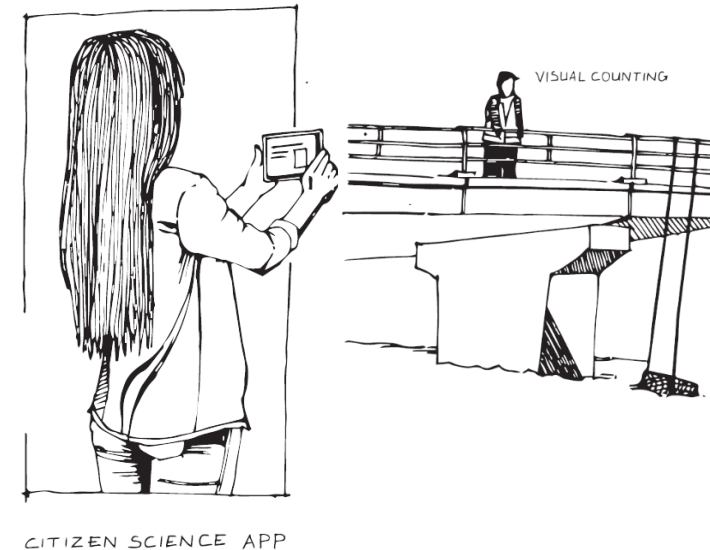


Crowd-based observations of riverine macroplastic pollution

Barbara Strobl¹, Tim van Emmerik², Jan Seibert¹, Simon Etter¹, Tijmen den Oudendam³, Martine Rutten⁴, Mohd Shahrizal bin Ab Razak⁵, and Iija van Meerveld¹

¹University of Zurich, Switzerland, ²Wageningen University, The Netherlands, ³Rotterdam University of Applied Science, The Netherlands, ⁴Delft University of Technology, The Netherlands, ⁵Universiti Putra Malaysia, Malaysia

Contact: TIM.VANEMMERIK@WUR.NL | @TIMVANEMMERIK



- Riverine macroplastic observations are crucial to tackle global plastic pollution challenge, but remain scarce
- Crowd-based observations provide frequent cost-effective data collection over a large geographical range
- We extended the [CrowdWater](#) app with a plastic pollution module for **floating plastic** and **plastic on riverbanks**
- Applications in the Rhine (Netherlands) and Klang (Malaysia) showed the data is comparable those of current methods

HOW IT WORKS

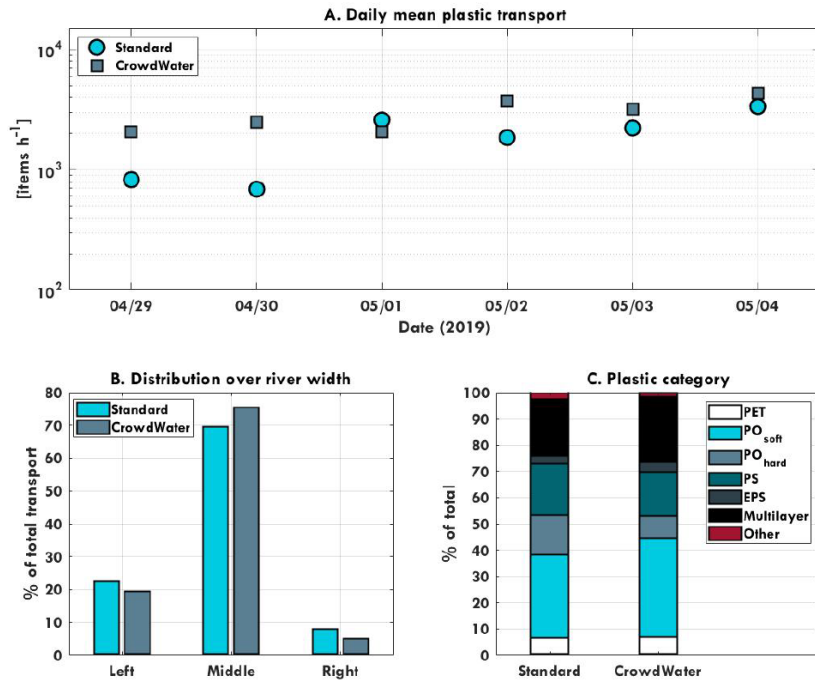
The screenshot shows the CrowdWater mobile app interface. At the top, there's a header with the 'crowd water' logo, a user profile picture, and notification icons. Below the header is a map showing a river location with a red circle indicating the current spot. The main form is divided into several sections:

- ADD SPOT**: A section with a close button and instructions: "What would you like to enter as a new spot? Please check if there already is a spot close to you that you can update with the (+) button." It features four buttons: WATER LEVEL, SOIL MOISTURE, TEMPORARY STREAM, and PLASTIC POLLUTION.
- Please select the type of observation**: Two buttons: FLOATING PLASTIC (selected) and PLASTIC ON SHORE.
- How long did you observe this location? (in minutes)**: A text input field with the value '1' and minus/plus buttons.
- Which proportions of the river did you observe?**: A question with a note: "If the river is too wide it might be easier to only count plastic pieces in 1/2, 1/3 or 1/4 of the river width." It has four buttons: ALL, 1/2, 1/3, and 1/4.
- Did you see any plastic?**: A question: "How many plastic pieces did you count during your stated time and over the stated width of the river?" It has eight buttons representing different counts: NO PLASTIC, 1-2 PIECES, 3-5 PIECES, 6-10 PIECES, 11-20 PIECES, 21-100 PIECES, 100+ PIECES, and COVERED ENTIRELY.
- Leave a comment..**: A text input field.
- 20/12/2019 | 02:05 PM**: A date and time selector.
- Advanced options**: Two checkboxes: "River is stagnant." (unchecked) and "I've removed the plastic." (unchecked).
- SAVE**: A large blue button with a checkmark and a timer icon.

- Choose between (1) floating plastic or (2) plastic on riverbanks.
- For (1) floating plastic, count all plastic items you can see floating by for X minutes. You can choose X.
- For (2) riverbank plastic, count all plastic items on a riverbank stretch. You can choose the length (1, 5, 10 m).
- Select a plastic pollution class, take a photo, and done!
- Advanced options: estimate plastic polymer categories, river flow velocity, remove plastic, and/or leave a comment.

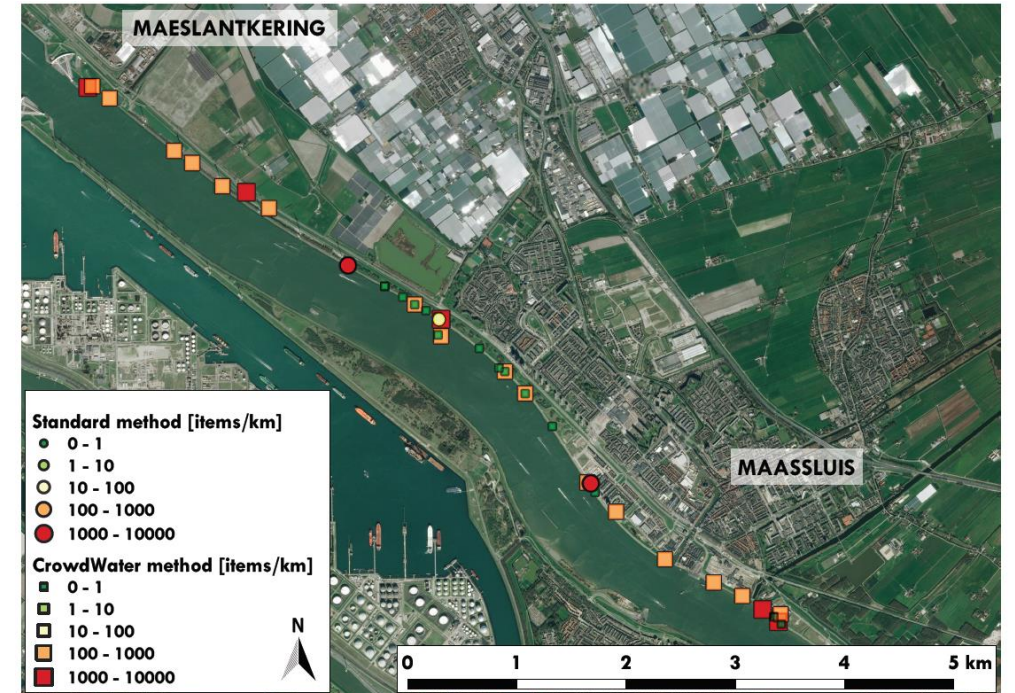
THE DATA YOU COLLECT

(1) Floating – Klang, Malaysia



- Crowd-sourced observations same order of magnitude as reference method, difference cause by better temporal spread of crowd-sourced data.
- Gives estimate of spatial distribution and plastic polymer categories.

(2) Riverbank – Rhine, Netherlands



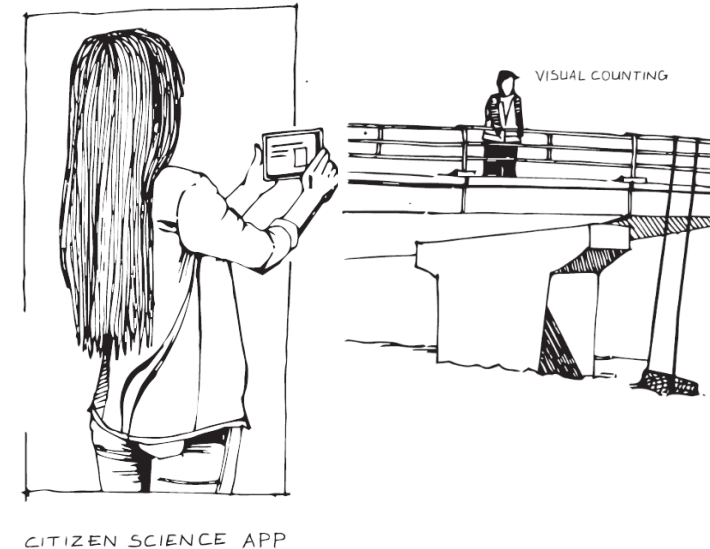
- Crowd-sourced observations give rapid estimate of plastic densities along the Rhine.
- Demonstrate the spatial variation, and emphasize the need for more observations.

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- Join us!
- Measure your rivers, especially now!
- <https://crowdwater.ch/en>