





## Using social media to collect flood data and expand the citizen science toolbox

## National Green Infrastructure Facility, Newcastle University

UKEOF Workshop: Using Social Media as a Data Source for Environmental Science



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UK COLLABORATORIUM FOR RESEARCH ON



## **Researcher in Hydrology:**

- Hydrometric monitoring
- Flood risk management
- Nature-based methods
- Community-based
- Citizen science monitoring







UKEOF Workshop: Using Social Media as a Data Source for Environmental Science









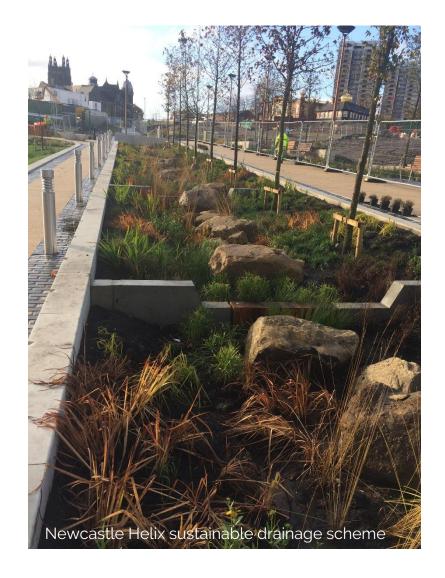




UKEOF Workshop: Using Social Media as a Data Source for Environmental Science









## **Crowd sourcing flood information**

• Example: 'Toon Flood' June 2012 (Newcastle upon Tyne)

"Gather as much information as possible from photos, eye witness reports and measurements to help them to understand the extent of the flooding around the region, its impacts and how to improve the resilience of the city and its infrastructure to similar events in future." Newcastle University.

• Smith et al (2015):





**Chronicle**Live



## Citizen science for catchment science: A rural case study from Northumberland

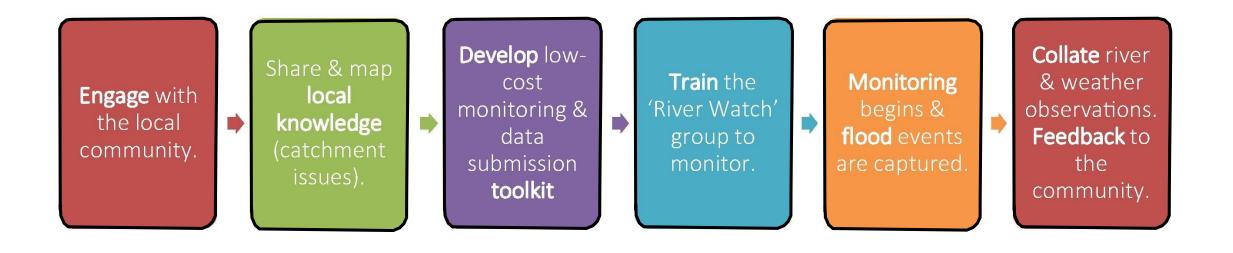
Haltwhistle Burn catchment, Northumberland, UK

https://research.ncl.ac.uk/haltwhistleburn/



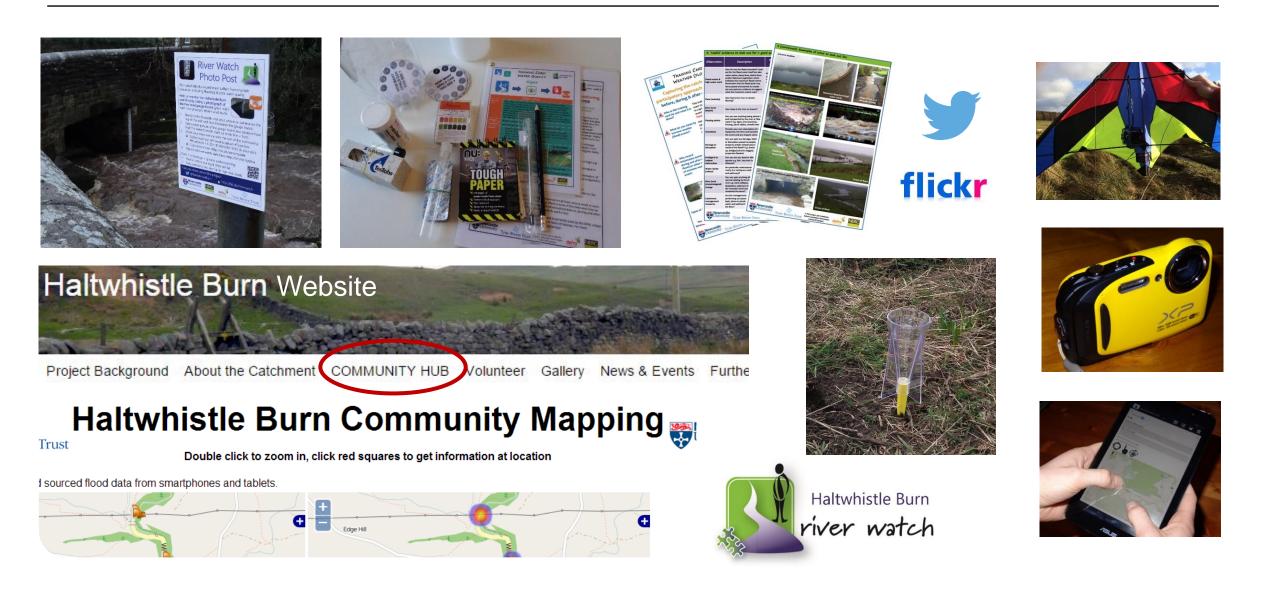


- Multiple stages where social media helped to support the wider monitoring programme
- Environmental data collection is (or should be) much broader than just physically collecting or extracting the data.













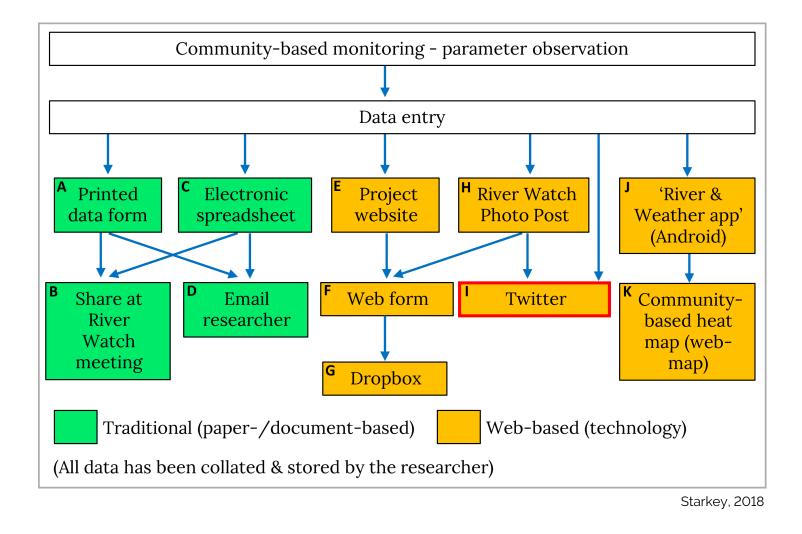
### • Methods: Data collection



Twitter	🔊 =/ 🗙			
Free tool available to use on desktop computers, smartphones and tablets;	#HaltwhistleBurn #RiverLevel #Flood #Rainfall #WaterQuality @HaltwhistleBurn			
Easy to download from app stores and update over time;				
User can post a short message online ('tweets' are 140 characters or less);	Image: Organization         Image: Organization			
Message can be accompanied by photographs, hyperlinks, locational information (geo- referenced) and tag	PHOTO VIDEO LIVE			
other users to alert them;	ASDFGHJKL			
Video and live streams now possible;	A Z X C V B N M ⊗			
Hashtags (see # examples) allow key words or phrases to be identified easily;	123 😅 🎍 space @ #			
Free data storage and hosting;	<ul><li>Wider community engagement anticipated;</li><li>Time stamp is automatic.</li></ul>			

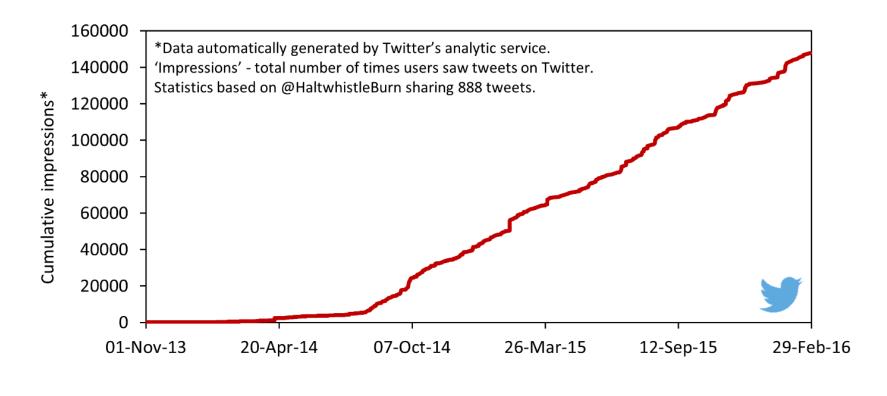


• Methods: data entry and submission





• Outputs: Engagement during the project

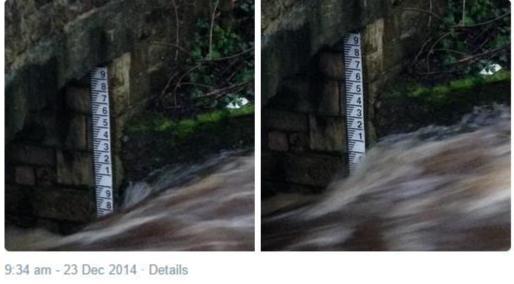


Starkey, 2018



### • Outputs: Data collection

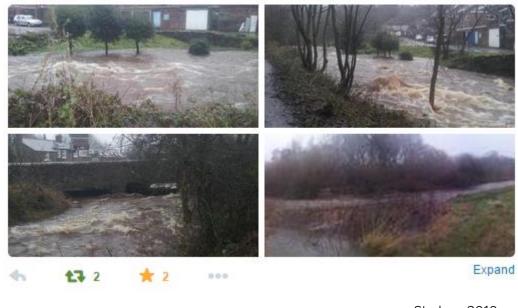
@HaltwhistleBurn #haltwhistleburn #riverlevel Townfoot 23/12/14 8.47 Both photos taken in the same second! Fast flow!



Collapse

Some heavy rain nearby. **#Haltwhistle** looks to be getting a hammering. Just a few spits here **#brampton @HaltwhistleBurn**.

#### @HaltwhistleBurn



13



Starkey, 2018

## Haltwhistle Burn

• Outputs: river level time series



• Outputs: data submission preferences

Starkey, 2018



• Outputs: wider benefits associated with involvement.

 Wider outcomes: New skills, knowledge, understanding, behaviour, progression, attitudes, values, enjoyment and inspiration "We are 78 and we enjoy learning new technology"

"I've enjoyed it"

"Looking forward to taking some rainy day photos  $\odot\,$  "

"Great collection – I'm getting into this science stuff"

"I've read in a couple of places that Twitter hashtags are not case sensitive so I've stopped using capital letters in them"

"Would it help if I showed people how to do the tweeting biz...?"

Starkey, 2018







## National Green Infrastructure Facility Newcastle University



UKEOF Workshop: Using Social Media as a Data Source for Environmental Science

Dr Eleanor Starkey – December 2020

### Citizen science – help monitor the swale!

EPSRC

UKCRIC

Wewcastle University

Swales are characterised by shallow, open and vegetated ditches which can offer multiple environmental and social benefits within the urban environment, including reduced flood risk.

helix

Wetland: stories and fitters urban runeer of vegetation-growth and altracts wildale

# Help build up a picture of how the swale behaves and changes over time. Here's what to do: 1. Align your feet with either the red or blue footprints on the pavement. 2. Take a photograph of the wetand (??) and experiment areas (??) curving different weather conditions. Please stay on the footpath and stay safe. 2. Take a photograph of the wetand (??) and experiment areas (??) curving the stay safe. 3. Take a photograph of the wetand (??) and experiment areas (??) curving the stay safe. 4. Take a photograph of the wetand (??) and experiment areas (??) curving the stay safe. 4. Take a photograph of the searchers and the local community. Ether

Gifferent weather continues reader by for a community Ether 3. Share your data with researchers and the local community Ether Tweet your observations to @NGIF\_UK (#Swale) OR Upload your observations using the webform OR code Ensure your observations include a date and time

green.infrastructure@ncLac.uk green.infrastructure@ncLac.uk #NGIF#Greeninfrastructure #Swale

National Green Infrastructure Facility, Newcastle University. Citizen science in an urban space. (Photo: E. Starkey)



## **Citizen science during COVID-19**

Date of your observation(s)
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28 Aug 2020

Time of your observation(s)

08:45

Upload your swale observation(s)



Notes - to describe your observation(s) and the weather conditions Very rainy, had been most of the night



National Green Infrastructure Facility @NGIF\_UK

Our **#NGIF #Swale** holding back water in **#Newcastle** to help reduce **#FloodRisk** in the city.

National Green Infrastructure Facility

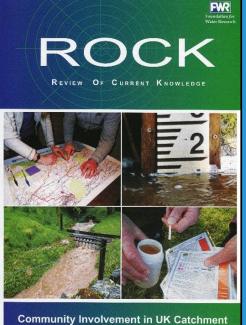
Photos via #CitizenScience photo post this morning. #SuDS #NBS #GreenInfrastructure



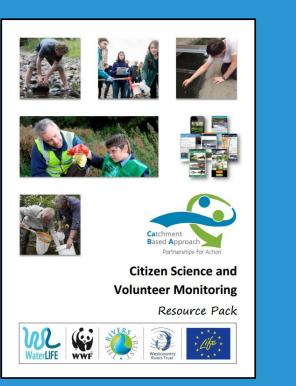








Community Involvement in UK Catchmer Management



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## **PhD opportunity**

### PhD opportunity via NERC-funded ONE Planet scheme

- "Monitoring the Impact of Green Infrastructure using Citizen Science in Urban and Rural Catchments"
- Project: <a href="https://bit.ly/3loIVOP">https://bit.ly/3loIVOP</a>
- How to apply: <u>https://bit.ly/32CoPtb</u>
- Deadline: 18<sup>th</sup> January 2021
- Lead organisation: Newcastle University with external partners.
- Start date: September 2021

