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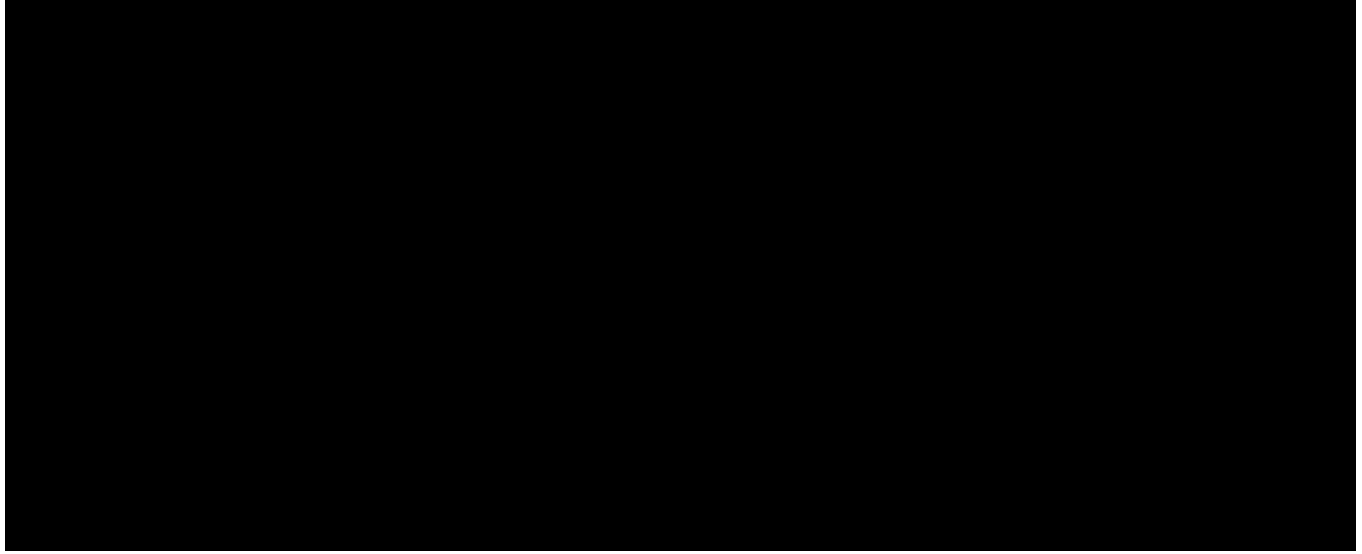
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AI, IoT and The Environment:

New Directions in Socio-Eco Informatics

Dr Richard Cook &
Dr Imogen Mansfield

Dr Richard Cook

Senior Lecturer, School of Business, Computing and Social Sciences

Interdisciplinary researcher: Computing, Business and Education.

Interests: AI-mediated interaction, human–computer interaction, participatory technology design, ethnography, education.

Currently researching how computational systems mediate sensory experience, environmental interaction and meaning-making through AI, sensing technologies, conversational systems and co-produced digital methods.

Member of the ED&I Committee;

Convenor Staff Neurodiversity Network

Cook, R. (2026, in print) Time, tempo and temporality: making sense of co-production. Qualitative Research.

Cook, R. (2026) The Social Construction of Nonsense. Secrecy and Society Special Issue: Subjugated Knowledges.

Cook, R., Vallego, J., and Mansfield, I. (2026) Talking to Trees: More-than-Human Communication through AI-Mediated Voice. SSRN. DOI: 10.13140/RG.2.2.21954.13768.

Cook, R. (2024) 'Crafting a "senseplace": the touch, sound and smell of graffiti'. The Senses and Society, 19(2), pp. 122–139. https://doi.org/10.1080/17458927.2024.2337104

Cook, R. (2023) 'Using an "ethnogram" to visualise talk in the classroom'. International Journal of Research and Method in Education, 42(2), pp. 159–169. https://doi.org/10.1080/1743727X.2023.2263373

Cook, R. and Hockey, J. (2023) 'Gravel cycling craft and the senses: scenes, sounds, vibrations, fatigue and typifications on off-road tracks'. The Senses and Society, 18(2), pp. 223–240. https://doi.org/10.1080/17458927.2023.2181138

Dr Imogen Mansfield

Research Assistant • Fast-Litter and Thinguistics

Research profile

PhD: monitoring plastic litter in bird nests across rural-urban sites.

Policy experience:
WRAP

Industry experience:
NovaMechanics, Cyprus

Research interests:

- Environmental monitoring
- Citizen science
- Accessible/open science
- Human-nature connectivity

Cook, R., Vallego, J., and **Mansfield, I.** (2026) Talking to Trees: More-than-Human Communication through AI-Mediated Voice. SSRN. DOI: 10.13140/RG.2.2.21954.13768.

Mansfield, I., Reynolds, S.J., Lynch, I., Matthews, T.J. and Sadler, J.P. (2024). 'Birds as bioindicators of plastic pollution in terrestrial and freshwater environments: A 30-year review'. *Environmental Pollution*, 348, 123790. doi:10.1016/j.envpol.2024.123790.

Nel, H.A., Chetwynd, A.J., Kelleher, L., Lynch, I., **Mansfield, I.,** Margenat, H., Onoja, S., Goldberg Oppenheimer, P., Sambrook Smith, G.H. and Krause, S. (2021). 'Detection limits are central to improve reporting standards when using Nile red for microplastic quantification'. *Chemosphere*, 263, 127953. doi:10.1016/j.chemosphere.2020.127953.

Socio-ecological informatics

A shared conceptual framework across both projects

PEOPLE

- Behaviour
- Participation
- Stewardship
- Attunement

PLACE

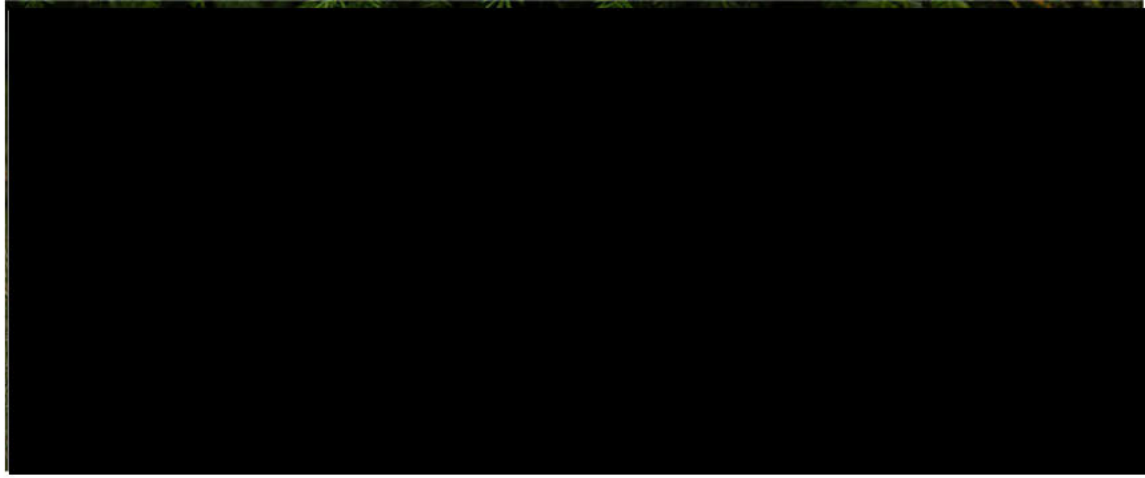
- Rural areas
- Woodlands
- Road sides

TECHNOLOGY

- AI
- IoT
- Digital interaction

How do people perceive the environment, and can technology help us better mediate these relationships?

Fast-litter Project



PEOPLE

- Litter Free Stroud
- Stroud District Council
- UK-wide councils (phase 2)

PLACE

- Stroud
- UK – wide (phase 2)

TECHNOLOGY

- Mobile App
- Dashboard

What is fast-litter?

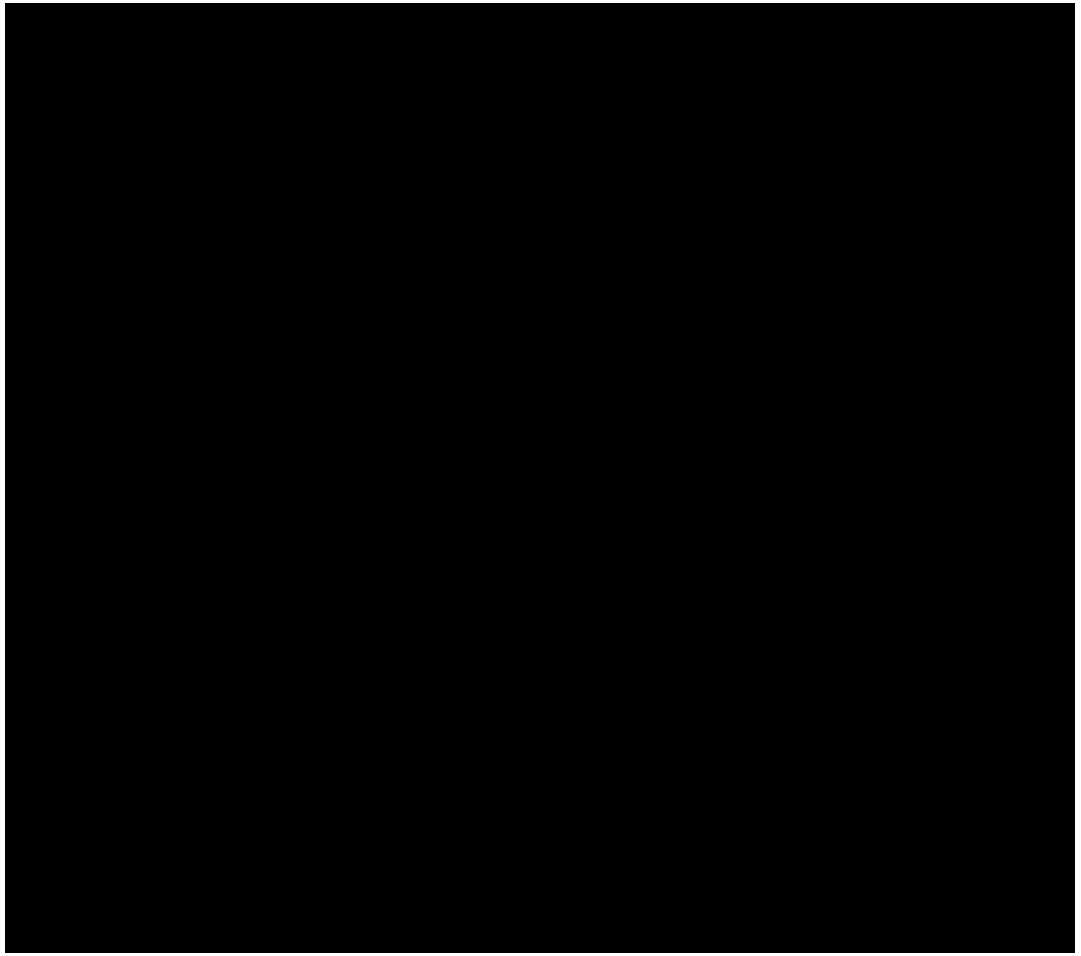
Branded **on-the-go** food and drink packaging

Why?

Rural litter hotspots

High rates of consumption and littering

Brand traceability and accountability



Technology

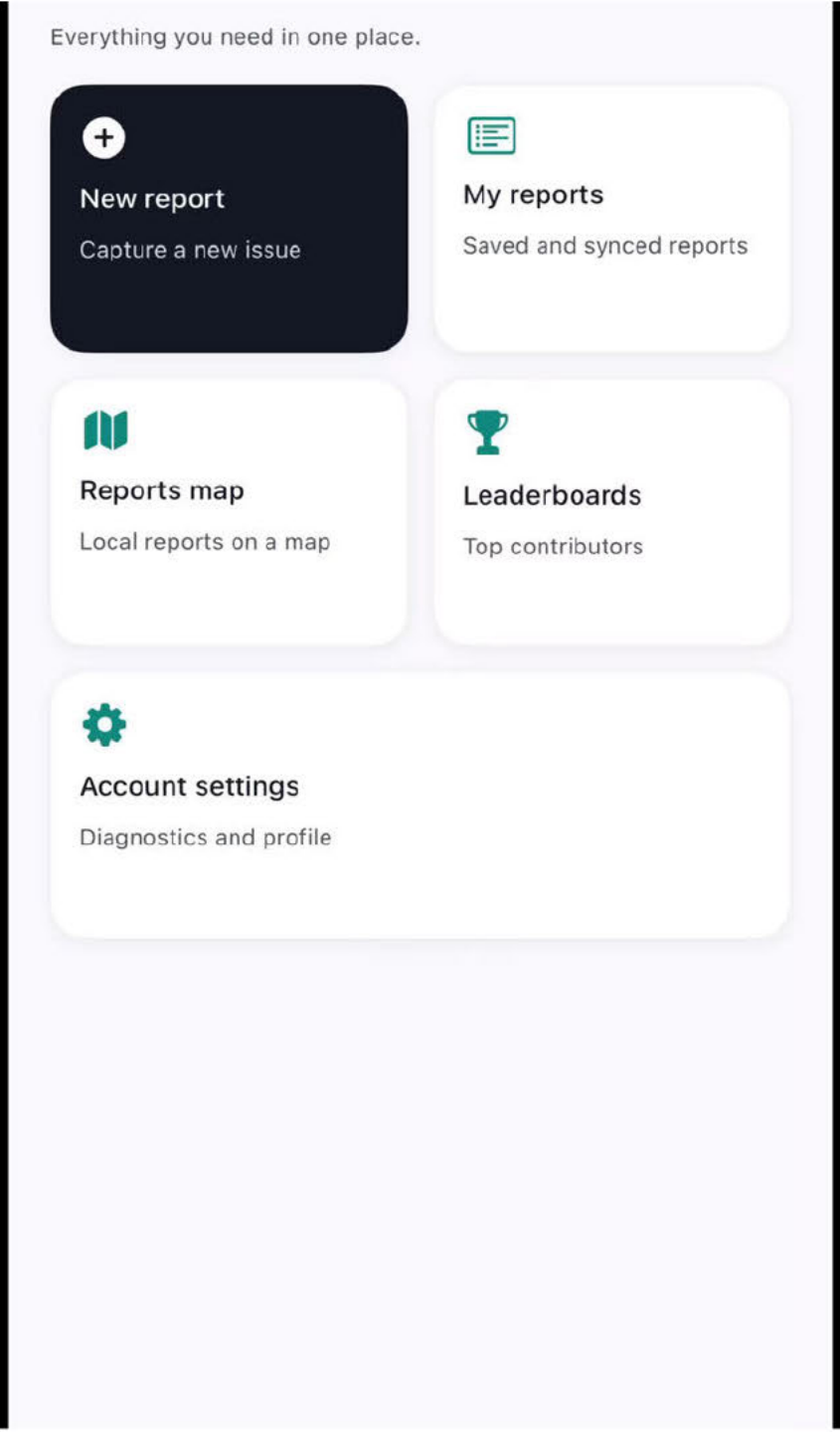
Mobile App

- Developed with Stroud District Council and Litter Free Stroud.
- Enables volunteer litter pickers to record litter as they collect it
- Captures what, where and when litter is found.
- Turns everyday volunteering into structured environmental data
- Empowers volunteers

Dashboard

- Maps and visualises litter types, locations and patterns **(hotspots)**
- Helps the council understand where and how littering occurs
- Supports evidence-informed approaches to local environmental management

Fast-litter App



Fast-litter Dashboard

Fast Litter activity

Total includes confirmed manual CSV and published mobile reports. Recent count uses published online submissions.

TOTAL SO FAR	IN THE LAST 7 DAYS
676	3

both.

- [x] Confirmed (manual / CSV)
- [x] Online (mobile app)

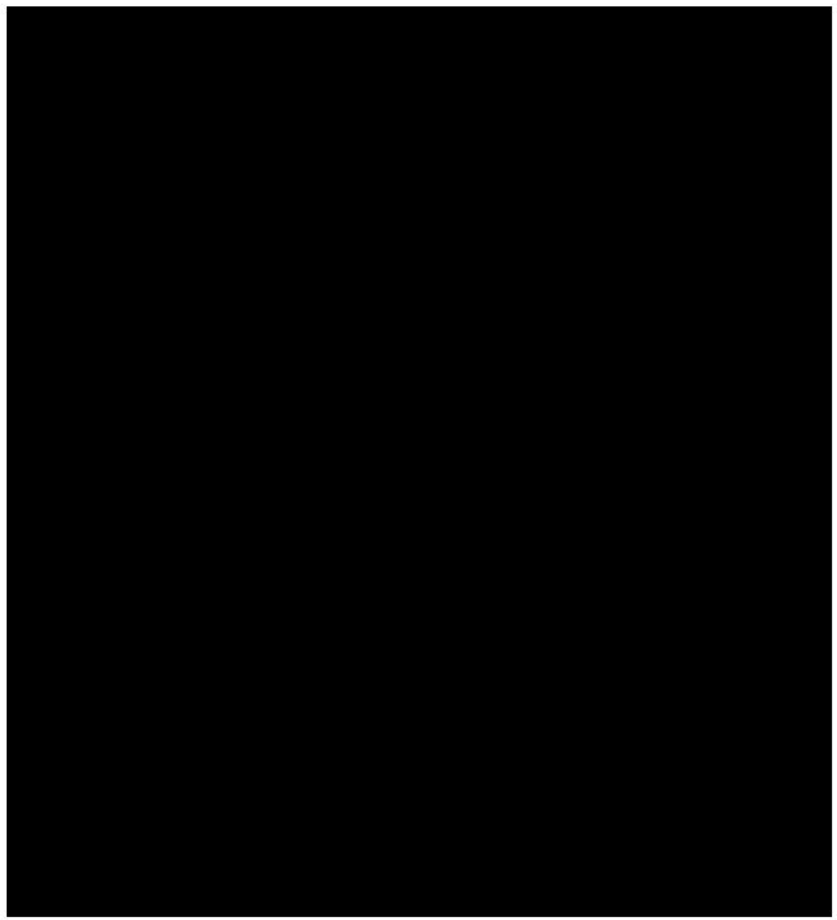
BRAND ▼

[redacted]

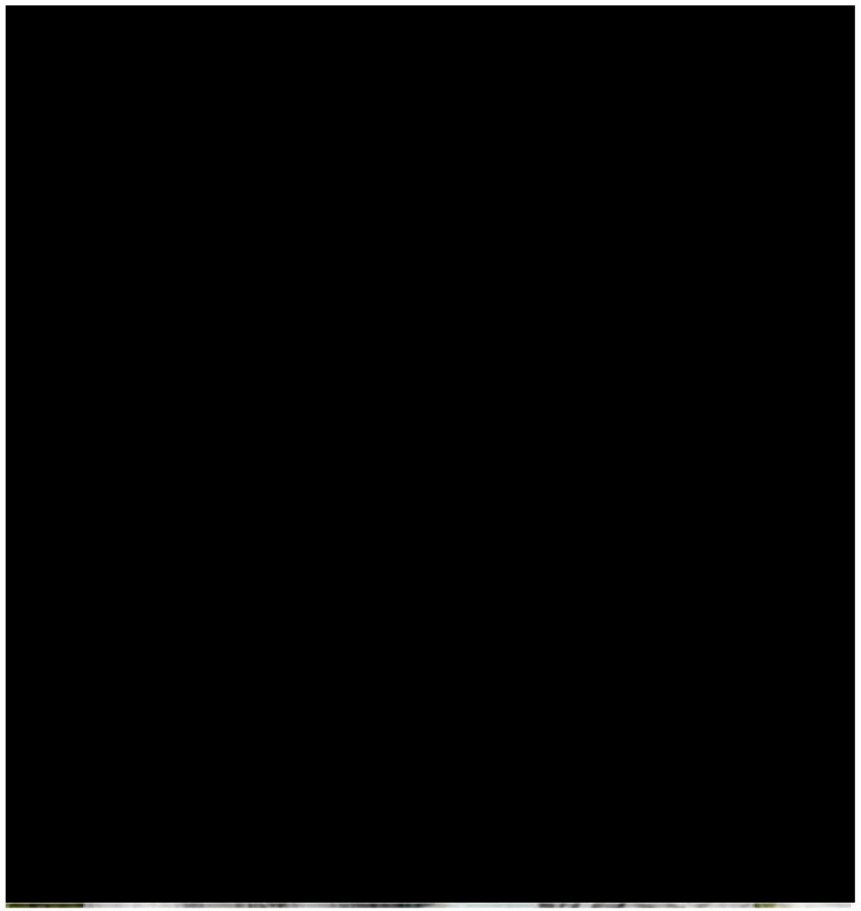
BRAND BRANCHES ▼

People

Stroud District Council



Litter-free Stroud



Behaviour

I don't go, oh God, not another [redacted] package. I don't want to carry that emotional burden. So, I try and go, okay, well, that's another piece of litter off the road."

"You do the pick and it’s straight back again. It's just distressing for me. I can't stop seeing it every five seconds. No journey is a pleasure anymore like it used to be. There’s just so much out there."

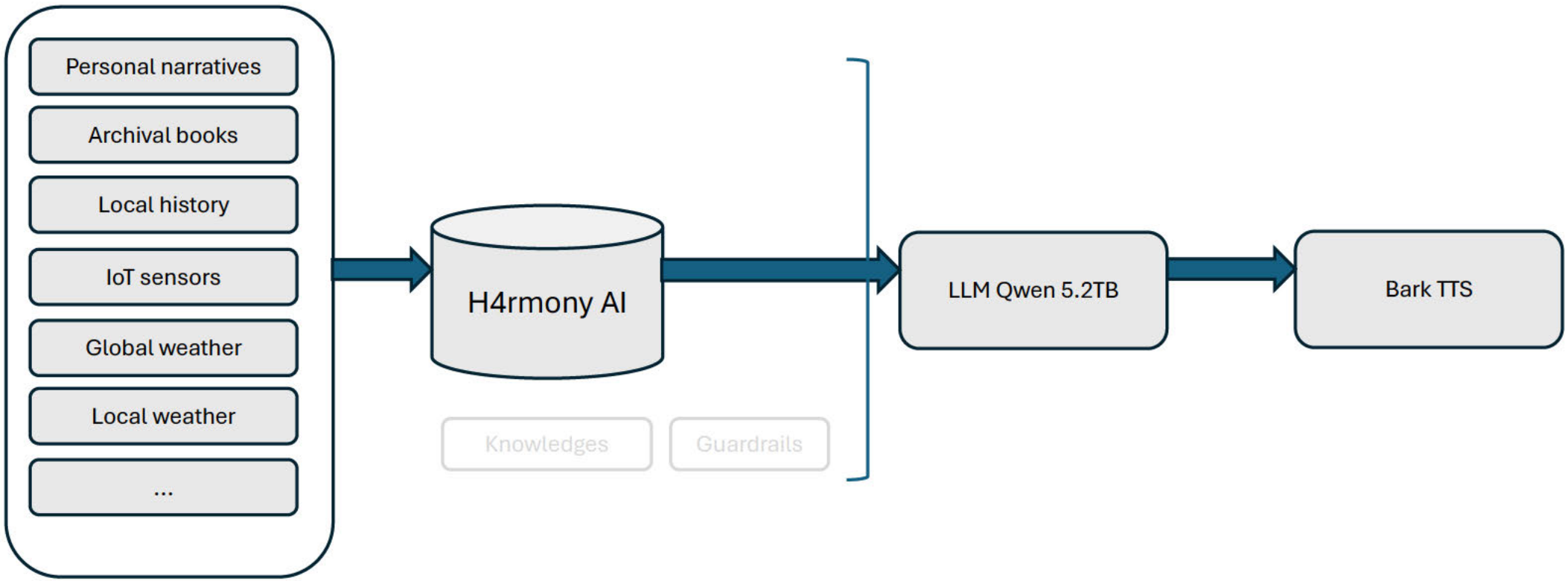
"Volunteering shouldn't be the solution, but I think it will always play an important part."

Outreach

- Exhibition
- App rollout
- Dashboard access
- Partnerships
- £1.4million equivalent media
- 7,120 unique website visitors (3months)
- BBC iPlayer



Thinguistics (Talking Trees)



DATA

INFORMATION

https://thinguistics.org/

Thinguistics Project



"Sweltering", "busy campus", "August", "disease" – these are markers of H4rmony AI transformed into relational intelligence

The failed soil sensor was interpreted as possible data of the onset of die-back

Phase 1: the proof-of-concept

What has already been established

01

Sense

IoT environmental sensors deployed on two trees at UoG Park Campus.

02

Connect

Sensor data integrated with AI to generate a prototype talking-tree persona.

03

Engage

Public engagement undertaken with Gloucestershire Wildlife Trust.

04

Disseminate

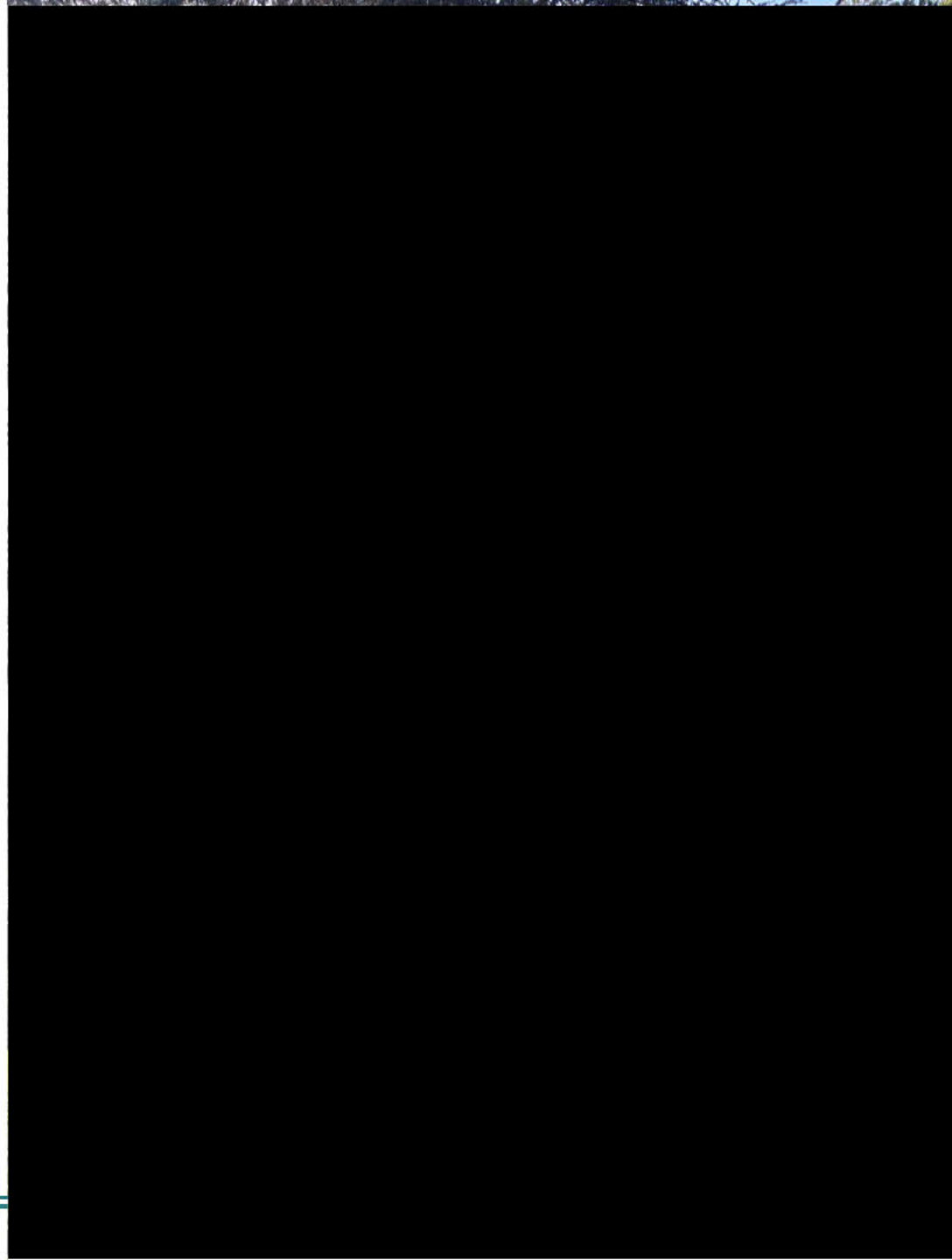
Research paper, website and public-facing materials established.

Phase 1 established the technical, research, public-engagement and partnership foundations for scaling.

Phase 2: scale up

The move is from one prototype to a distributed, testable research system. Seeking to develop authentic persona.

- 25 trees across Gloucestershire Wildlife Trust (GWT) + Cheltenham Borough Council (CBC) sites
- 5 native UK species (River and meadow?)
- 25 sensor-grounded tree personas and river persona
- Ecological monitoring + climate resilience
- Human-nature engagement evaluation with **Connectedness to Nature Scale** (CNS) and **Nature Connection Index** (NCI)



Phase 2: three work packages

A linked pathway from ecological data to interaction to evaluation

WP1

Ecological Monitoring & Climate Resilience

Generate tree-specific environmental data

- TinyTag local temperature logging
- Live Fuel Moisture Content sampling

→

WP2

AI-enabled Tree Personas

Transforming data into chat. New method for NLP

- Oak
- Black Poplar
- Ash
- Silver Birch
- Beech

→

WP3

Human–Nature Relationships & Stewardship

Evaluate whether interaction changes nature connectedness

- 30 GWT staff/volunteers
- Talking-tree vs factual comparison
- CNS + NCI pre/post
- 4-week follow-up + interviews

Impact pathway

Four linked routes from research activity to practical and future value

01 **Climate resilience**

Ecological monitoring → evidence for tree management, climate adaptation and local planning.

02 **Accessible tree data**

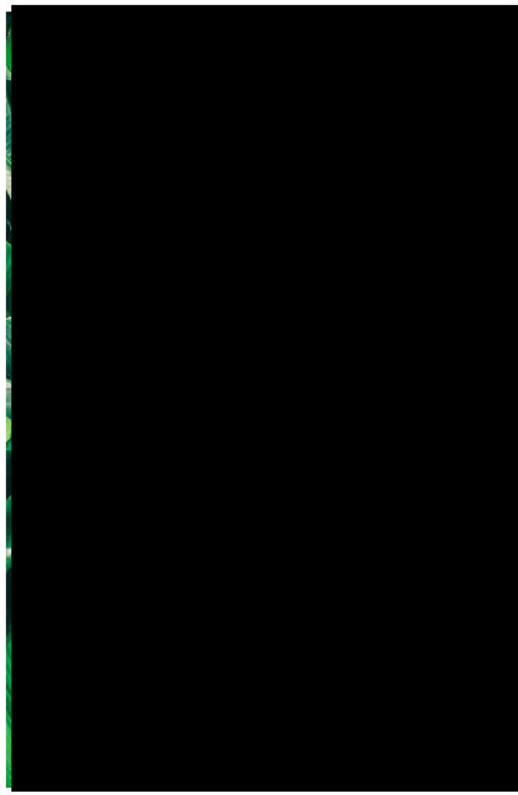
Sensor data → individualised, traceable interactions for visitors, volunteers and researchers.

03 **Nature connectedness**

Interaction → measured changes in connectedness, plus qualitative evidence about stewardship.

04 **Scaling**

larger external funding, making more things talk, push not pull interactions.



Future goals

Questions emerging from the environmental fieldwork

Social norms

- If the countryside functions as a bin, why? Routines, habits and motivations
- If people throw cups and packaging into rivers and canals, why?
- How do new consumer behaviours create new environmental impacts and new meanings of place and space?

Relational intelligence

- Phenomena and artefacts can enable new ways of knowing.
- Stewardship is linked to relational intelligence and attunement to living things.

Future goals

Attunement, relational intelligence and stewardship

From prediction to participation

•Prediction is part of the story — but so is attention.

•Active participation can mean talking about nature, talking with it, and being in it.

•Attunement and relational intelligence frame stewardship as an active practice.

Beyond conventional separations

•Move beyond viewing nature as an asset, resource, or aesthetic object.

•Challenge dualisms and assumptions of human exceptionalism.

•Ask how Western and European ontologies shape our relationships with the more-than-human world.

•FROM ATTENTION TO ACTION

Technology as research infrastructure

Moving beyond off-the-shelf methods

01

Understand

Use technology to create infrastructure for understanding some environmental behaviours.

02

Interact

Provide mechanisms for observing, talking and involving ourselves with people, space and place.

03

Develop

Move beyond off-the-shelf methods towards a new methodology.

A methodological proposition: technology is not only a tool for measurement, but part of the infrastructure through which people encounter, interpret and participate in environmental knowledge.