# STORY 4. Futuring Data for Eco-Social Health

### Community Oceans Futures Group[[1]](#footnote-1) at Simon Fraser University in Vancouver, Canada

In North America, shoreline cleanups have become a popular community activity. The goal is to remove trash from creek beds, riverside parks, lakefronts and beaches so that it does not end up in open water ecosystems. These activities give participants a sense of accomplishment through getting outside, getting some exercise and spending time in nature.

A typical cleanup is about more than just picking up trash, however. Volunteers are also asked to count and categorize the items that they collect, and weigh the total volume of garbage collected. The data is then uploaded to a central ‘citizen science’ repository through an App called Ocean Swell.[[2]](#footnote-2) This app uses standardized categories to tabulate the trash found in shoreline ecosystems.

The result is a longitudinal North American database of human generated marine debris. This data has been successfully mobilized to advocate for new marine protected areas, bans on single-use plastics, and Extended Producer Responsibility policies.

Unfortunately, however, little to no reduction in the total amount of plastic pollution has been documented because of these activities or the resulting policy changes.[[3]](#footnote-3) What is more, a 2022 meta-review of citizen science projects in the journal *Sustainability* found that volunteer data gathering had no clear link to behavior changes that could ‘lead to cultural shifts’ in plastics use and consumption.[[4]](#footnote-4)

Given this state of affairs, our work tries to understand and rethink the link between citizen-generated insights and social change. We want to develop new tools to support citizen participation in knowledge building about issues like marine garbage.

To this end, in fall 2022 we did some background research by holding a shoreline cleanup at an oceanside park in Vancouver, Canada. Afterwards we held focus groups to better understand how participants experienced data gathering.

The first thing we noticed was that participants were deeply affected by what they witnessed during the cleanup. For example, several participants talked about finding a ‘shocking’ amount of styrofoam particles mixed into the sand on the shoreline, leading one participant to observe that it was like ‘trying to count a liquid’.

However, the act of tallying quickly displaced people’s sense of shock or outrage. Tallying became the focus of cleanup activities because participants needed to figure out how to fit trash into the categories provided. Groups spent a great deal of time discussing how to interpret and fill the tally sheet.

Overall, while participants reported feeling positive about contributing to a cleaner environment they did not exhibit a deeper awareness or understanding of the scale of the trash problem, nor did they make the cultural connections between ocean plastics and consumerist behaviors. We found that the event didn’t help them develop an understanding of their own relationship to the problem, or, indeed, their relationship to potential solutions.

In the face of these challenges, our goal is to design alternative ways of producing insights about marine health. In the months since our cleanup we’ve been working on design solutions to complement or replace tally sheets.

Our first step was to better articulate the problem.

Humans are fundamentally interconnected with marine ecosystems. But our entire system of knowledge production about marine health is based on the assumption that humans are separate from nature; that humans are autonomous, conscious and intentional in how we produce knowledge about nature. In this way of thinking, we humans should gather ‘data’ about ‘trash’ before processing it into information and eventually scientific knowledge about a topic like marine health.

This process of abstraction leads to a huge loss of situated knowledge, as is shown in Figure 1. The data that volunteers gather gets tabulated into information that is used to produce scientific insights as well as policy interventions. But people’s connection to trash -- their sense of shock or their creative observations -- are lost in the process.

A diagram of a waste management process

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Figure 1. Data Activation Gaps (Concept Katherine Reilly and Melanie Vidakis, illustration Jihyun Park)

When we ask volunteers to do the work of collecting data about ‘trash’ - when we frame the problem as one in which the ocean and marine debris are discrete, separate and measurable via the objective apparatus of science - we are asking volunteers to pretend that garbage and oceans are separate from ourselves. In doing this, we are asking them to reproduce their hegemonic relationship with the ecosystems that they actually form a part of. So in producing knowledge about quantities of trash, citizen science initiatives are reproducing the assumptions that give humans permission to relate to the ocean in harmful ways. The work is counterproductive to the goal of producing healthy ecosystems that also include healthy humans.

As a possible solution, one of our team members suggested asking volunteers to imagine their bodies as the ocean, and put the garbage *in* their bodies. This would help them visualize how their health would be affected if they had garbage in their own personal ecosystem.

A diagram of a person's body

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Figure 2. What if your body was the Ocean? (Concept Javier Fernandez, illustration Jihyun Park)

Ironically this is not a metaphor! Recent research has found microplastics in human *placentas*, and research has also shown that they are ingested by newborn babies.[[5]](#footnote-5) Since microplastics carry substances that interfere with the human hormonal system, scientists hypothesize that the trash that floats in each of our personal ‘oceans’ is already having long term health effects.

But we ended up moving beyond a body-as-metaphor-approach because our human relationship to the ocean is not metaphorical.

Instead we decided to embrace a more-than-human approach to contemplating our relationship to ecosystems. More-than-human approaches seek to produce knowledge through exploring and experiencing the relationships between different parts of an ecosystem. In doing so they de-centre humans as the purpose for and source of all change in the world, and reposition them as but one factor enmeshed in complex relationships with both the natural and built environments.

Doing this work requires a fundamental rethink of the notion of ‘data’ as the driver of knowledge. Data is usually positioned as discoverable *facts*, *containers* of meaning, or solidified *agreements* about what we all assume to be true. These visions of data all suggest that the world has been stopped, like a butterfly specimen pinned to a board, ready for our inspection. And of course, we humans are the ones who have ‘pinned down’ these ‘specimens’.

In contrast, relational approaches to data-as-action, data-as-movement or data-as-mutual-becoming understand the world to be in constant motion, and given this, focus on the processes of meaning making that surround observations or experiences. They might ask us to explore how it feels to see tiny beads of styrofoam mixed into the sand on a beach; to imagine what our relationship to the ocean might be like under different ‘truth’ conditions; or, to explore the political representation of different species in struggles over how to ‘know’ the world. Relational approaches tell us that the truth of styrofoam on a beach is not in *its* existence, but in our mutual and collective *subsistence*. They understand that data isn’t about plastic, but is itself plastic.

The approach represents a shift away from the DIKW model[[6]](#footnote-6) in which **D**ata gets categorized into **I**nformation that can inform **K**nowledge and **W**isdom for use in, say, policy making. Instead, we want to develop an ERAC framework in which we center people’s **E**xperiences and processes of **C**hange through continuous **R**eflection and **A**ction (see Figure 3). In our vision, an ERAC approach becomes the foundation for building meshworks of knowing how to rebuild direct ties between people and their environment.[[7]](#footnote-7),[[8]](#footnote-8)

A diagram of a pyramid

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Figure 3. Meshworks as alternative forms of Ecosystem Knowledge (Concept and illustration Jihyun Park)

Ultimately, in doing this work we hope to reposition data as a generative and liberating *action*, rather than as a *form* of capture and control. Our goal is for observations or experiences to be freed of the categories and parameters that prevent social change.

Our next steps will be to continue to develop new techniques or tools that complement or replace the tally sheet. Our group is exploring design and creativity as tools to help us think *impulsively* –that is with passion, desire, intuition and inclination– about our relationship to the health of the ocean. We plan to draw on futuring and speculative design to help participants in shoreline cleanups imagine a world free of human generated marine debris.

1. The Community Oceans Futures Group at Simon Fraser University (SFU) is an interdisciplinary collaboration between scholars and community members studying the relationship between knowledge production, design and post-human ontologies. In practical terms, this means that we are rethinking what it means to ‘know’ or ‘relate to’ the world around us. Our current project focuses on reimagining how humans relate to human debris in marine ecosystems. The group consists of Rachel Horst, Jihyun Park, Dr. Katherine Reilly, Dr. Gillian Russell, Ryland Shaw and Melanie Vidakis. We are also working with Oscar Chu, Sunho Chung, Javier Fernandez, Maia Puyat, Jaddie Tan, and Xiao Wei from Vancouver’s Centre for Digital Media (CDM). [↑](#footnote-ref-1)
2. Ocean Conservancy. https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/cleanswell/ [↑](#footnote-ref-2)
3. Keisha Rukikaire, ‘Comprehensive assessment on marine litter and plastic pollution confirms need for urgent global action’, United Nations Environment Program, 21 October 2021. http://www.unep.org/news-and-stories/press-release/comprehensive-assessment-marine-litter-and-plastic-pollution [↑](#footnote-ref-3)
4. Cristina L. Popa, Simona I. Dontu, Dan Savastru, and Elfrida M. Carstea, ‘Role of Citizen Scientists in Environmental Plastic Litter Research—A Systematic Review’, Sustainability 14.20 (2022): 13265. https://doi.org/10.3390/su142013265 [↑](#footnote-ref-4)
5. Gwyn Wright, ‘Microplastics can cross placenta into unborn babies, study shows’, The Independent, 28 December 2022. https://www.independent.co.uk/news/health/microplastics-in-humans-baby-placenta-b2252375.html [↑](#footnote-ref-5)
6. Jennifer Rowley, ‘The wisdom hierarchy: Representations of the DIKW hierarchy’, Journal of Information Science 33.2 (2007): 163–180. https://doi.org/10.1177/0165551506070706 [↑](#footnote-ref-6)
7. Tim Ingold, Bringing Things to Life: Creative Entanglements in a World of Materials, ESRC National Centre for Research Methods, University of Aberdeen, Scotland, 2010. https://eprints.ncrm.ac.uk/id/eprint/1306/1/0510\_creative\_entanglements.pdf [↑](#footnote-ref-7)
8. Kari Martin, ‘The Hope of Creation – a Conversation with Timothy Ingold’, The Kenan Institute for Ethics, 26 January 2021. https://kenan.ethics.duke.edu/the-hope-of-creation-a-conversation-with-timothy-ingold/ [↑](#footnote-ref-8)