A JOURNAL BY SISSA MEDIALAB

ARTICLE

Where does affect go? Exploring the (online) sharing of affective nature experiences by ecological citizen scientists

Helen Verploegen, Noelle Aarts, Irma Arts and Riyan van den Born

Abstract

Online citizen science platforms for nature observations provide valuable data for nature enthusiasts and scientists, but typically emotions and feelings experienced in nature are not shared there. Through focus groups with users of the Dutch citizen science platform Waarneming.nl, we explored how affective nature experiences are shared. We found that citizen scientists exchange affective experiences through face-to-face conversations or social media and hear about others' experiences through traditional media. Affects are shared to enthuse others to go into nature, respect or connect more with nature, feel recognized and cope with varying affects experienced in response to environmental loss. Yet, these affects are generally not shared on platforms like Waarneming.nl as these media are associated with knowledge production, science and policy, which users perceive to be in opposition to affect. We reflect on this perceived tension between science and affect, suggesting potential ways to overcome this.

Keywords

Citizen science; Environmental communication

Additional Keywords

affect; nature experience

Received: 29th January 2025
Accepted: 14th December 2025
Published: 26th January 2026

1 ▪ Introduction

Nature enthusiasts increasingly share observations of flora and fauna online. In addition to general digital media platforms — such as personal blogs or social media — specialized platforms like eBird or iNaturalist have emerged where users upload and view observations. These platforms are forms of ecological citizen science, where observations are made accessible to researchers and policymakers to advance knowledge and contribute to nature protection [Dickinson & Bonney, 2012].

However, they are arguably more than scientific initiatives. These platforms, and ecological citizen science or nature volunteer projects in general, also facilitate nature experiences[1] and come with a range of affects such as joy, happiness, worry or anxiety [Singh, 2013; Foster, 2018; Sharma et al., 2019]. Nature based citizen science activities do not only engage participants cognitively but also help develop environmental empathy, where emotional connections with nature are formed. This can help reduce or reverse the 'extinction of experience', where people feel an increasing alienation from nature with less personal connection and/or access to nature [Schuttler et al., 2018]. In a previous study, we found users of the Dutch citizen science platform Waarneming.nl have highly sensory, embodied and affective experiences in nature [Verploegen et al., 2024]. These experiences are filled with love and care, but also with sadness over the decline of species and landscapes. Based on this, we argue that sharing observations are affective acts where observers, with more or less intensity, feel moved or touched enough by an experience in nature to share it with others or their future selves. Yet, little of these affects are found on citizen science platforms. Rather, the information shared is factual, such as the name of an observed species, and the time and location of the observation.

These previous findings raise a range of questions that are explored in this article: (1) why are these affects not (more explicitly) shared on these digital platforms? (2) are these affects shared elsewhere, and, if so, then where and why? (3) do users of these platforms feel the desire to share affects (more)? (4) how could affects be shared more easily (online)?

We are particularly interested in these questions during times of environmental loss. Emotions and affects felt in response to this loss receive increased attention from interdisciplinary perspectives. For example, Craps [2020] gives an overview of the diverse terminology and vocabulary that has been developed in different disciplines to describe the variety of emotions experienced in response to the environmental crisis — such as grief, eco-anxiety or solastalgia. In their review, Ojala and colleagues [2021] indicate that numerous worldwide studies show that significant numbers of people experience worry, anxiety, grief or hopelessness about climate change and ecological loss. They stress that how people deal with these emotions is crucial for avoiding low well-being, and that talking about emotions, creating shared meaning and community are important to constructively cope with these feelings and positively contribute to environmental problems.

As we further explore below, we understand the sharing of affect as relevant for a variety of psychological, social, and cultural reasons. For example, sharing affective experiences has been found to help with personal coping [e.g. Ojala et al., 2021], setting in motion societal change [e.g. Papacharissi, 2014], and contributes to cultural memory [e.g. Cvetkovich, 2003].

1. We refer to nature experiences as those interactions with more-than-human lifeforms in an outdoor setting (not including domesticated animals).

We examine the need for more space to share these affects to contribute to this affective momentum.

In this study we explore why and how affective nature experiences are (not) shared on platforms used to record, identify, and aggregate biodiversity observations, and the future potential of these platforms to share affects that users experience at times of environmental loss. We do so based on focus groups with users of Waarneming.nl; a Dutch platform developed for biodiversity observations and launched in 2003 among a community of birdwatchers to share observations of nature with each other. The platform now has thousands of users, ranging from dedicated birdwatchers to curious citizens sporadically sharing observations of plants or insects in their gardens. Waarneming.nl is an example of an ecological citizen science platform, where citizens contribute data on species occurrence, utilizing the possibilities of mobile technologies [Dickinson & Bonney, 2012]. Data is made accessible to researchers and policymakers for knowledge advancement. At the same time, users form a community that shares nature experiences online. Given the importance of both data collection and affect in caring for nature, we take this platform and its community as a starting point. We explore if this sharing of observations can also come to include affects, aiming to inform those involved in ecological citizen science projects and particularly coordinators of observation platforms, about the possibility of including affect.

2 ▪ Theoretical background

Throughout this study, we follow a Spinozian-Deleuzian understanding of affect, referring to emotions, feelings and bodily states emerging from relations with (more-than-human) others [Lorimer, 2015; Singh, 2018; Verploegen et al., 2024]. As such previous studies show, a wide range of affects are experienced in nature. Varied affects are experienced simultaneously and in close connection with cognition and action [Gregg & Seigworth, 2010]. Both feelings such as love or worry can be productive in coping or setting in motion action, depending on the context [Ojala et al., 2021], therefore, we avoid categorising affects as 'positive' or 'negative'.

Although affect is relational, it remains unclear to what extent the affects people experience in nature are shared with others. Yet, the sharing of affect has been found to be of relevance for multiple psychological, social and cultural reasons. We outline four perspectives on the relevance of sharing affect based on interdisciplinary research: (1) sharing affect to cope, (2) sharing affect to trigger affect in others, (3) sharing affect for societal and political change and (4) sharing affect to remember. Here we consider studies on affect in the broadest sense, also including work on emotions or feelings. Although these concepts have varied meanings in different fields, they are similar enough to use interchangeably here.

Firstly, expressing one's feelings (to others) is a strategy for coping with daily experiences. Studies in psychology for example mark the benefits of 'emotionally expressive coping' in relation to loss or illness (through e.g. writing in journals or discussing with friends)[e.g. Stanton & Low, 2012]. Ojala and colleagues [2021], in their study on coping with global environmental problems, emphasize the importance of meaning-focused coping, where people find positive meaning in their actions because they believe their actions and those of others can make a difference. The ability to face environmental risks and find positive value in the struggle to address them, is called 'constructive hope' [Chawla, 2020, p. 631].

Additionally, Ojala and colleagues [2021, p. 49], note it is constructive to "put words to one's worries and talk about these feelings" to get more control over these emotions, feel recognition in the emotions of others and "create a shared meaning". This is not limited to affects as anxiety or worry — sharing enjoyment and positive events has been linked to more resilience [Arewasikporn et al., 2018] as well as overall happiness and life satisfaction [Lambert et al., 2012].

Secondly, sharing affect has the potential to ignite similar affects in others. Such 'emotion contagion' is widely studied in psychology as a process in which the emotion of a perceiver becomes similar to those expressing the emotion [Hatfield et al., 1993] and has also been found when mediated by digital media [Goldenberg & Gross, 2020]. Such social sharing of emotions has been shown to strengthen social bonds [Rimé, 2007]. Furthermore, emotions, as well as associated behavior, spreads through social networks in space and time, as experiences are shared again with others — particularly for highly affective events [Rimé, 2007; Christakis & Fowler, 2009].

Thirdly, sharing affect has been linked to social and political change. The sharing of emotions online contributes to binding social groups and can support societal and political action, as for example empirically shown in the context of Me Too or Black Lives Matter movements. The internet has the potential to create 'affective publics' [Papacharissi, 2014] and the move from 'collective action' to 'connective action' [Bennett & Segerberg, 2012]. However, the ability of online media to bind social groups has also been linked to polarization and should be considered with caution [e.g. Boccia Artieri et al., 2021].

Finally, sharing affect contributes to collective memory. By sharing affects online they are "stored, managed, displayed, compared, shared" and made retrievable for the future [Serrano-Puche, 2019, p. 530]. Archiving affects allows users to remember what events took place in the past and how they made us feel, creating an 'archive of feelings' [Cvetkovich, 2003, p. 7]. These archived feelings and emotions, of the past and the present, can challenge or affirm current and future values within communities that determine political choices [Lockwood, 2016], such as the protection of nature.

How affects are shared can differ greatly. Today, affects are increasingly shared online, as our daily lives are highly mediated by digital technologies — including our interactions with the natural environment [Jørgensen, 2014]. Citizen science platforms have specific affordances; options and tools (i.e. submission fields, menus or texts), that limit or stimulate actions that are in line with a platforms' intentions and goals (e.g. data collection and processing) [Skarlatidou et al., 2019; Verploegen et al., 2021]. To share affect, affordances to express, share, consume and evaluate affect must be in place [Bareither, 2019; Steinert & Dennis, 2022]. In this study we consider both expressing (sharing) of affect, as well as consuming (viewing) affects of others, as important when determining how sharing of observations can come to include affects.

3 ▪ Materials and methods

3.1 ▪ *Participants and sampling*

Four focus groups were organized with 17 active users of Waarneming.nl in the Winter of 2023 (see Table 1), leading to over eight hours of recordings and four meeting reports. Focus

groups are considered an anticipatory methodology, relevant for exploring topics that participants are likely not familiar with and allowing speculation and discussion of possible future developments [Macnaghten, 2017]. Cyr [2019] recommends focus groups as suitable for studies where target audiences are not familiar with the themes under discussion, and so we found this data collection method appropriate for capturing user discussions about the place for affect in the use of ecological citizen science platforms.

Focus group	Total participants (#Male, #Female)
Focus group 1	2 participants (1 male, 1 female)
Focus group 2	5 participants (3 male, 2 female)
Focus group 3	3 participants (2 male, 1 female)
Focus group 4	7 participants (6 male, 1 female)

Table 1. Focus groups and participants.

Participants were sampled through snowballing and by asking visitors attending a national nature organizations' open day. We aimed for 4–5 participants per focus group. Limited availability, cancellation and rescheduling of participants led to the makeup of the focus groups reflected in Table 1.

All participants had to be active users of Waarneming.nl at the time of the focus group, meaning they shared observations on the platform on different occasions over the last year. Dutch nature volunteers, including users of Waarneming.nl have been found to more often be males, of a higher age, highly educated, and show a bias towards bird observations [Ganzevoort et al., 2017]. Despite these overrepresentations, platforms like Waarneming.nl also attract a diverse range of users, including those who register observations more frequently than others, those who record different biological classes rather than one class, such as birds, and those with varying knowledge backgrounds. To improve diversity in (studies on) citizen science [Paleco et al., 2021] we aimed to include a diverse range of users with varying interests, backgrounds, experiences and perspectives, so our findings go beyond the dominant user group.

Although males are overrepresented in our sample, each focus group included at least one female participant (Table 1). We also captured a wide variety of ages and life stages in the study, ranging from recent university graduates to pensioners. Participants also ranged in how active they were on the platform, with avid participants sharing observations daily or weekly to occasional users who share observations a few times a year. Participants either just started using the platform or were long-term users, i.e. for 20 years. A diverse interest in biological classes was expressed with a slight overrepresentation of those interested in birds.

Participants gave informed consent to participate. They were informed about the context of this project, the researchers involved, and what their participation entailed (e.g. time investment, option to stop or retract participation). They were informed that notes would be taken, audio would be recorded, and that data would be processed and analyzed anonymously for use in publications. Furthermore, they were informed where data would be stored, who would have access to these files, and that all data would be removed within 10 years. Data is managed following the data management policy of the research institute. Following faculty regulations, no further formal ethical approval was required at the time of carrying out this study, given the research design, non-sensitive topic of the study and the target population.

3.2 ▪ *Structure of focus group*

Each focus group was moderated by the first author. The third or fourth authors were present as notetaker — each in two of the focus groups. The group discussion started with shortly introducing the general research project and ground rules. Participants then introduced themselves, sharing how long they had been using the platform and why they use it. Participants were asked to shortly share a registered observation that had made an impression on them, to start discussing their (affective) nature experiences.

The focus group consisted of four sections that covered 1) participants' experience in nature, particularly their feelings and emotions 2) how participants shared their nature experiences with others, 3) how they heard or read about the nature experiences of others, and 4) brainstorm about possible ways to share affective nature experiences online. To start off this brainstorm three future possibilities to share affective nature experiences on Waarneming.nl were shown, using mock-ups of new options on the website with: (a) additional text motivating to share experiences in the existing 'notes' field when submitting an observation, (b) an additional field on the submission page to multiselect feelings from a drop-down menu, (c) an additional submission page in a diary-like format, combining written text, image, video and/or audio.

This structure was systematically followed during each focus group. During the data collection process, we made small adaptations based on insights we gained, ensuring we collected the desired information [Cyr, 2019]. In the first and second group we found participants needed more context on our interest in environmental loss. We observed that participants remained focused on their personal need to share, rather than the potential societal benefit of sharing (i.e., helping to protect nature or remember lost nature). During the third and fourth focus groups we provided more context on this before the start of section 4, to get the most out of the brainstorm and answer our research question sufficiently.

3.3 ▪ *Analysis*

We used mind mapping to analyze the data collected from the focus groups. As Fearnley [2022] poses, mind mapping is a useful alternative to transcription and coding qualitative data, particularly when researchers are aware of the contexts relevant to the study and for more complex data sources such as focus groups. As this study does not focus on the specific discourse (e.g. word-use), but rather aims to explore the contexts discussed, a clear overview was achieved through mind mapping. In this study, mind mapping was particularly suitable for identifying the relationships between the identified topics.

The first author conducted a first analysis of the meeting reports made by the notetakers, identifying topics that stood out because they reflected recurrent views and remarks that participants generally agreed upon. These were structured in a mind map with the research questions as starting points (see Appendix). The first author then listened to the recordings of the focus groups to add or specify topics and refine the analysis. The first author discussed the identified topics with the co-authors to check if they recognized or missed topics and identify alternative interpretations. Following this, the authors clustered the topics into three larger themes.

The results section below is based on the topics of the mind map and the discussion section is structured along the clustered themes. Relevant quotes included in the results section were identified whilst listening to the audio recordings.

4 ▪ Results

4.1 ▪ *Describing affect*

Participants mentioned a variety of affective nature experiences — such as seeing a very rare species, their first observation of a certain species or feelings of relaxation when out in nature. They described such experiences as "special" or "amazing" and expressed feelings such as "euphoric", "fun", "happiness", "enjoyment", "wonder", "fascination", "surprise", "peace", "relaxed" or "connected [to nature]". Some participants also shared feelings regarding loss of species and landscapes, such as "frustration", "anger", "powerless" or "pain".

Initially, relatively little diversity was observed in the vocabulary used to describe nature experiences. Participants tended to discuss more factual descriptions of events, with less articulation of comprehensive feelings or emotions. More targeted questions from the moderator, such as "how did that experience make you feel?", helped to get more in-depth information on the affects experienced when participants were too focused on factual descriptions.

4.2 ▪ *Sharing affect with others*

When asked whom participants shared their affective experiences in nature with, they expressed sharing specific affective experiences, with specific people, through specific media. For example, a participant expressed they shared a particular type of affective experience (i.e. enthusiasm for seeing a certain bee) with a particular person they felt would be 'responsive' to hear about this in a face-to-face conversation or a text message. Such people included family members, friends, colleagues and/or other nature enthusiasts:

> "If a conversation goes in a certain direction, and I think, oh that person is responsive to it, then I will share [...] Tomorrow I will go into work and I know there are a few colleagues who also have affinity with nature. If the conversation goes there, then I will probably say 'oh, yesterday I saw such a beautiful mushroom, the *rosy bonnet*, have a look' [...] at a certain point you know what people like it and who don't." [FG1_2]

Participants shared affective experiences in nature in face-to-face conversations, through messaging apps, or in meetings of nature organisations. Such organisations also provide magazines, reports or newsletters in which some participants shared affective experiences. Participants also shared affects on social media platforms such as LinkedIn, Instagram or Facebook.

Nearly all participants agreed that they were sufficiently able to share affective experiences with others and did not feel a longing to share more about this. Yet, some participants wondered how to share affective experiences with a broader public than only direct contacts.

4.3 ▪ *Hearing about other people's affects*

Participants expressed that they most often heard about other people's affective experiences out in the field during face-to-face conversations: "you talk about it with peers" [FG2_1].

Additionally, they heard about affective experiences through television, documentaries, traditional printed media (such as magazines about nature and non-fiction books) or social media. Particularly Facebook triggered differing opinions among participants, deeming the platform's specific pages for nature enthusiasts as very useful, whilst criticizing the type of content shared on the platform overall and the simplistic interactions through e.g. 'thumps-up' responses.

When asked what hearing about the affective experiences of others brought participants, they expressed it led to feelings of recognition, and helped grow their own enthusiasm for (going into) nature: "the enthusiasm [of others] is contagious" [FG2_2]. Participants emphasized that they appreciated when affect was shared in a way that brought across someone's enthusiasm and described this as a 'skill' that not everyone has. Some participants also added that they learned more about nature by hearing about the experiences of others.

4.4 ▪ *Personal and societal value of sharing affect*

Participants expressed multiple values of sharing affective experiences with others, both on a personal and societal level. Sharing affect helped to feel recognized, and to become more enthusiastic about experiencing nature. They also hoped to enthuse others for nature and/or increase people's connection with nature, specifically in the context of nature degradation and human disconnect from nature. Some participants described the sharing of affect as a form of "tempting" [FG1_2] others to look at nature, increase curiosity and respect for nature:

> "I find it important that people are interested in nature and respect nature, that they treat nature well. And I think all our interactions contribute to that." [FG1_1]
> "When I am taking pictures with my phone, people pass by and think 'what are you doing?'. Some will ask me what I am taking pictures of, and I will tell them I don't know and will look it up in the app. Then they will ask what kind of app it is and install it themselves. That is also how you take people along, that they go and explore themselves." [FG2_3]

Some participants wished to normalize conversations about affects related to environmental loss (e.g. sadness or fear) or human-nature conflicts (e.g. current themes of discussion in the Dutch context such as the return of wolfs or measures to limit nitrogen emission):

> "I never have the idea that I can change their opinion, but by talking about it I can normalize it for them, that not only the newspapers write about it or the mainstream media, but that people they know also say that nettles are emerging because of nitrogen." [FG3_3]

Moreover, some participants felt that sharing helped them to cope with affects related to destruction of landscapes or loss of species.

4.5 ▪ *(Not) sharing of affect online*

Users were asked if they shared affect on Waarneming.nl, to which almost all replied they did not. Some participants expressed they did so under certain circumstances, for example, when registering an observation of a 'special' species (e.g. rare or unexpected), describing their experience in more detail in the notes section of the submission field. Others noted they used to share affective experiences but no longer did. Participants who indicated that they did not share affective experiences on Waarneming.nl explained that this was because of the factual and scientific identity of the platform. Participants implicitly or explicitly considered Waarneming.nl a 'citizen science' platform, which they generally associated with knowledge production, research, science and policy. They also linked this to scientific standards such as systematic registration. Participants did not consider sharing affective experience in this scientific context:

> "I have never considered [Waarneming.nl] as a place to share my experiences, I have other ways to do that. I rather see Waarneming as a place to share what has been seen and for research. To collect a lot of data and show others what has been seen in the area." [FG2_2]

Participants were motivated to use the platform because of the use of their observations for scientific research, in policy and to inform and inspire other users on the platform. They questioned if sharing affect would be useful for these purposes:

> "I think Waarneming is a database to know what species are located in the Netherlands. I think that is the primary goal of Waarneming.nl, to track what lives in the Netherlands for the purpose of nature-development and policy. So I notice that I don't go looking for experiences there…I will share those with people around me." [FG1_2]

Users also explained they did not share affect on Waarneming.nl because of (implicit) norms of the platform, noting that no one else shared such affective experiences: "at the start I added extra information [about experience], but I saw that almost no one did that, so I stopped doing it" [FG1_1]. Another participant compared it to messaging groups specifically set up for locals to share nature observations:

> "if I want to share a little bit of experience, 'how I walked around and saw a willow warbler', then I immediately get the response 'stick to notifications in this group'. It's the same on Waarneming." [FG4_5]

Although participants thus questioned the use of such affective information given the norms of the platforms and its scientific identity, during the discussions it emerged that participants do see potential to do so in the future. In two of the focus groups, participants themselves proposed that researchers like "us" (referring to the social scientist conducting this study) could be interested in such information. When asking participants if it would motivate them to share such affects if they knew this would be of interest to (social) scientists, almost all participants agreed:

> "you would have to explain to me what you are going to do with it, and if I am convinced that you are going to do something with it [I will share it] [...] Give me the necessity and I will do it." [FG2_1]

In the third focus group, participants also questioned the emphasis on the scientific nature of the platform and put more emphasis on its role in nature experiences, challenging the idea that science and affect are unrelated or opposed: "I don't think [experience and factual knowledge] have to be separated" [FG3_1].

4.6 ▪ *Future of sharing affect on Waarneming.nl*

In line with this future potential, during the final phase of the focus groups, participants were presented with three options for how Waarneming.nl could accommodate and motivate users to share affects on the platform (see method). Participants were critical of the first two options, where sharing affect was part of submitting an observation, either in the already existing 'notes' field or by means of a new drop-down field. This was not so much a fundamental but rather a practical objection, based on the work required for recording in the field and the perceived utility of this information for others.

Participants responded positively to the presented option of adding an additional page to the platform where users could share their experiences in a narrative form (either in written word, video, audio or photo series), with the possibility to link these experiences to particular observations or other users they shared the experience with. Some participants deemed this option particularly relevant for sharing information about observations they did not have, but would have expected on a certain day (so called 0-observations):

> "I walked around for three hours, it was very hot, and I saw [only] six bees. [...] No one knows now that someone was there for three hours and that is very bad. If you can share a series of observations and add a description: 'I walked here for three hours and it was hopeless'." [FG4_3]

These 0-observations came with specific affects related to environmental loss (e.g. hopelessness) that cannot be captured in the registration of observations alone. Here participants also expressed once more that they would be more likely to use this option if they knew the information would be used, for example for research by social scientists.

5 ▪ Discussion

In this paper, we have explored why and how affective nature experiences are (not) shared on nature observation platforms, based on focus groups with users of Waarneming.nl, a Dutch citizen science platform. We identified three important overarching themes: the divorce between science and affect on observation platforms, the strategic communication of affect, and user preferences for ways to merge the affective and factual content on these platforms.

5.1 ▪ *The divorce of science and affect*

Platforms for biodiversity observations are considered citizen science initiatives, both in research and practice. The participants in our focus groups confirmed this by explicitly describing Waarneming.nl as a citizen science platform or by using a variety of related concepts (knowledge production, research, science, policy, or nature protection). Although the scientific nature of platforms like Waarneming.nl can differ according to what understanding of citizen science is followed, through its design and mission statements, Waarneming.nl sets norms and expectations that inform this scientific identity [Verploegen et al., 2021].

Furthermore, when participants referred to knowledge production, research or science in our focus group, they seemed to implicitly refer to a specific type of science: 'natural science'.[2] This hints at a relatively narrow conception of science and specific assumptions about what science is and should be: quantitative, objective and unrelated to affect. Thereby, other types of data collection and methodologies are excluded.

As Lorimer [2015, p. 39] argues in the context of nature conservation, this understanding of science dates back to the Enlightenment and is linked to "the Human as rational [and] disembodied" and underlies why conservation science does "poor service" to affective encounters in the field. Conservationists are "wary of discussing the passions that power conservation…affective energies seem taboo, their public acknowledgement threatening to undermine the credibility of the subjectivity natural knowledge that they helped generate" [Lorimer, 2015, p. 38]. Yet, these subjective and affective experiences are very much part of the observation of wildlife. Participants seem to acknowledge the affective elements of their experiences in nature but at the same time feel that the sharing of this affect does not 'belong' in the scientific context of an observation platform such as Waarneming.nl.

Although communities of social scientists and humanities scholars have challenged this dualism [Latour, 1993; Daston, 1995; Milton, 2002], the conversations in these focus groups are a humbling reminder that this is not the common understanding. Observers seem to separate their passions and affects from their (registered) nature-observations, making some 'wary' to share these affects and passions [Lorimer, 2015] — and some to actively question or oppose the sharing of affect in this 'scientific' context.

This explorative study suggests that observers experience a separation between the sharing of observations versus the sharing of affective experience. Observers share their affective experiences, but only in contexts they deem not-scientific, such as everyday conversations or on social media. We argue this needs to be interrogated in future studies and reflected upon in practice for three main reasons. Firstly, this arguably 'impoverishes' [Whitney, 2013] environmental discourse in a scientific and policy context. To achieve a flourishing more-than-human world we do not only need data and monitoring, but also need to talk about and motivate affective relationships with species and landscapes. It also continues the (false) idea that science is not inherently connected to passions and emotions. Secondly, this separation between affect and science excludes scientific practices beyond the natural sciences. The affective nature experiences of observers can be relevant to study by social

2. In Dutch (the language of the focus groups) 'science' [wetenschap] refers to all scientific disciplines, including the social science [sociale wetenschappen] and humanities [geesteswetenschappen]. Whilst in the English language 'science' is more generally used to refer to the natural sciences, this is thus less common for the use of 'wetenschap' in Dutch.

scientists or humanities scholars to further knowledge on people's relation to nature, as suggested by some participants. Thirdly, platforms such as Waarneming.nl are also archives that help platform users remember (and study) the presence of (lost) species and how we related to these. We wonder if such an archive should include the affective experiences between humans and nonhumans, in addition to their presence.

5.2 ▪ *Strategic communication of affect*

As explored above, users of Waarneming.nl tend to separate affect from knowledge production, science or research, in line with the platform's norms and perceived identity, rather putting affect into a separate category. Participants seem to evaluate for a specific situation what type of information is appropriate: affective (shared with family, colleagues or peers) or scientific (shared on Waarneming.nl). This evaluation can be understood as a form of strategic communication, where people — albeit unconsciously — deem certain forms of communication suitable within certain contexts, to achieve certain outcomes [van Woerkum & Aarts, 2008]. Participants had well-articulated goals or expectations with the sharing of their (affective) nature experiences, and actively choose *whom* to share *what* affective experiences with and through *what medium*. Participants particularly shared affective experiences to enthuse or 'tempt' others to go into, appreciate, respect or feel more connected to nature.

This relates to previous studies that indicate how emotions are socially transmitted and can result in 'affective publics' who have the potential to spark societal or political change [Hermida, 2014; Papacharissi, 2014]. The (online) expression of emotions over environmental issues can also help establish credibility — to position oneself as caring and loving — but it should be considered that this can also be contested and undermined as the expression of emotion can be framed as irrational and deceptive, thereby devaluing the argument [Stevens et al., 2020].

This makes the sharing of affect dependent on context. It takes 'work' to evaluate what feelings are appropriate to feel or share in a given situation [Hochschild, 1979]. This was, for example, expressed by participants who shared affective experiences with those they deem 'responsive' to it. In these cases, the 'latitude of acceptance' of others is evaluated, determining what type of information is deemed relevant and is likely to be accepted [Sherif & Hovland, 1961]. Although this depends on specific individuals, the broader context is of equal importance. While users of Waarneming.nl are likely to be responsive to the affective experiences of others, the context of Waarneming.nl is deemed inappropriate to share these experiences. On the platform, certain explicit or implicit norms are active that guide how the platform is used. The platform has its own 'emotional regime' [Reddy, 2001] with different "set[s] of norms, rituals, styles, and collective modes that frame which emotions are relevant to a social group and how they should be expressed and managed" [Serrano-Puche, 2019, p. 29]. Based on this study, users seem to evaluate platforms like Waarneming.nl as a place where affect does not 'belong'.

This emotional regime, or lack thereof, is created by the structure of the platform. The affordances provided do not motivate users to share affect. This is reinforced by the lack of users who share affects, thereby setting the norm for other users and by the scientific characteristic of Waarneming.nl which is deemed unrelated to affect.

5.3 ▪ *Future affective affordances on observation platforms*

The above findings, when considered within the theoretical context, prompt questions about the perceived gap between affect and science. In line with the norms of the platform and its perceived identity, participants had not previously considered sharing affect on Waarneming.nl as relevant and expressed that their need to share was fulfilled in face-to-face conversations, through organizations or (social) media. Yet, they responded positively to future possibilities for sharing affect on Waarneming.nl, expressing that they would use a proposed option to share their experience in a narrative style on a designated submission page. For example, sharing a series of images or a written report of their day out in the field, linked with the observations they registered. By creating an additional page on the platform where affective nature experiences can be shared in a narrative form, the norms of the platforms and its (scientific) identity are broadened whilst keeping current options and usages in place. In doing so, the perceived divide between science and affect may be challenged without hindering current usage of the platform and aligning with broad motivations of users.

In some (digital) citizen science projects, researchers have already found interaction between cognitive and affective dimensions. For example, Torres and colleagues [2022] found affective expressions in comments on species observations among citizen scientists, including admiration about aesthetic nature experiences and friendly comments that helped form affective attachment to the project.

Participants in our study were or became particularly enthusiastic about the option to share affective experiences on Waarneming.nl in light of its usage for scientific research in the social sciences or humanities. This highlights that, next to personal motivations to enjoy, connect with and learn about nature, contributing to science and nature conservation are main motivations among those registering biodiversity observation, as also found by Ganzevoort and colleagues [Ganzevoort et al., 2017].

This links to additional benefits that sharing of affective nature experiences on observation platforms may have. Narratives about affective nature experiences are sources to contextualize observational data and learn more about people's relationships to and valuation of nature, informing research, conservation practices and environmental policy. This aligns with the call to integrate relational values of nature into environmental policy for more effective and just transitions, capturing the meaningfulness people attach to their interactions with nature in addition to more instrumental and economic valuations of nature [IPBES, 2022].

Furthermore, the sharing of affective nature experiences could contribute to user engagement, retention and overall experience. As highlighted by Phillips and colleagues [2019], affect is an important dimension for engagement of citizen scientists. Providing more explicit space for these affects may speak to specific or new groups of users who are interested in and motivated by modes of nature experiences or citizen science beyond data collection. Providing a variation of tasks and activities that align with the varied motivations of citizen scientists and volunteers is of importance for retention [Ganzevoort & van den Born, 2023; Sextus et al., 2024]. Providing explicit space for nature experiences, allowing users to share their affective experiences and be inspired by others' affective experiences, recognizes experiential and social motivations, and gives more meaning to significant nature experiences [Ganzevoort & van den Born, 2019].

6 ▪ Reflections and conclusion

To conclude, we reflect on limitations and recommendations for future research. Firstly, organizing focus groups came with methodological difficulties in finding diverse participants through snowball sampling. Nevertheless, the included participants were diverse in their professional background, type of use of the platform and demographics and provided sufficient information for this exploration. Other approaches, like organizing focus groups with already existing communities (e.g. local birding groups) would have improved the ease of sampling but arguably would have led to less diversity.

Furthermore, the participants who took part in the focus groups contributed significant time without monetary incentive. This suggests a strong interest of participants to contribute to our scientific research, although we also noticed social incentives for participating, as a result of snowballing. The finding that participants were motivated to share observations/affect for scientific use, might be stronger in this scientifically interested group. There are also users on platforms such as Waarneming.nl that are less scientifically interested/motivated, for example those that are more motivated by the competitive character of the platform. However, our findings are in line with previously research [Ganzevoort et al., 2017; Ganzevoort & van den Born, 2020]. This also aligns with the platform's mission.

Additionally, discussing affective experiences came with barriers in language. As in other studies, we observed limited vocabulary in discussing feelings and emotions experienced in nature and regarding environmental loss [Holthaus, 2022]. This likely reflects how little and/or superficially these experiences are discussed in everyday life. This was not only perceived among the participants but also experienced by us as researchers. It was a constant process of reflection on what terms to use in our questions (affect, emotion, feeling, experience etc.), to make sure participants were sufficiently triggered to share their affective experiences, without putting participants off by overly emotional phrasings. Asking about experience, explicitly noting at the start of the focus group that we were interested in the emotional elements of these experiences rather than the factual elements, and asking follow-up questions where needed was effective.

Finally, our analysis was based on mind mapping of themes emerging from meeting-reports and audio recordings. More implicit topics or subtle discourses that may have been represented in detailed transcripts could have been lost in this approach. Yet, given the explorative nature of this study, our approach allowed for sufficient overview of main themes and the relations between them.

Despite these limitations, this explorative study led to insights that can guide and specify further research related to sharing nature experiences and affects on and beyond citizen science platforms. Through this study we showed that participants shared affective nature experiences to feel recognized by others, in line with the personal coping of sharing affect. Secondly, they shared affect to enthuse others to go into, respect and connect more to nature, to trigger affects in others and to contribute to societal change. To a lesser extent, participants were interested in sharing affect to remember these experiences. However, users were susceptible to adding functionalities to share such affective experiences on Waarneming.nl in a separate page dedicated to archiving these experiences. Participants were particularly motivated to share such experiences when these were of interest to scientists.

Based on these insights, this study triggered reflection on the divorce between (scientific) knowledge and affect. This is a humbling reminder to scientists in the social sciences and humanities to be sensible to the prevalent distinction between science and affect in society. We encourage exchanging experiences with providing space for nature experiences on observation platforms. For example, iNaturalist provides options for social sharing and narrative 'journal' content and initiatives such as greenmapper.org that stimulate users to share information about places in nature that they love. Additionally, we can learn from experimental initiatives that give space to affective expressions, like the digital memorial 'What is Missing' (Maya Lin) or online projects as 'Is This How You Feel?' (Duggan).

Future research could look at how affective affordances and functionalities can be implemented on observation platforms and how users perceive and make use of these affordances. Communicating why it is of interest to share these experiences, either for personal interest, social change or scientific research would be recommended. We additionally recommend further reflection on how (interdisciplinary) researchers could benefit from studying such shared experiences. Further experimenting with options to share affect is best done in close collaboration with users of the platform to ensure new functionalities align with their motivations and expectations, improving uptake and avoiding potential resistance.

We encourage those involved in nature observation platforms and other ecological citizen science projects, such as project coordinators and designers, as well as practitioners in environmental conservation and researchers to find effective ways to cross the boundaries between the factual and affective.

Acknowledgments

We want to express gratitude to all participants who took part in the focus groups for this study. We also want to thank the reviewers of the article for their valuable comments. The authors received no financial support for the research, authorship and/or publication of this article.

A ▪ Mind map

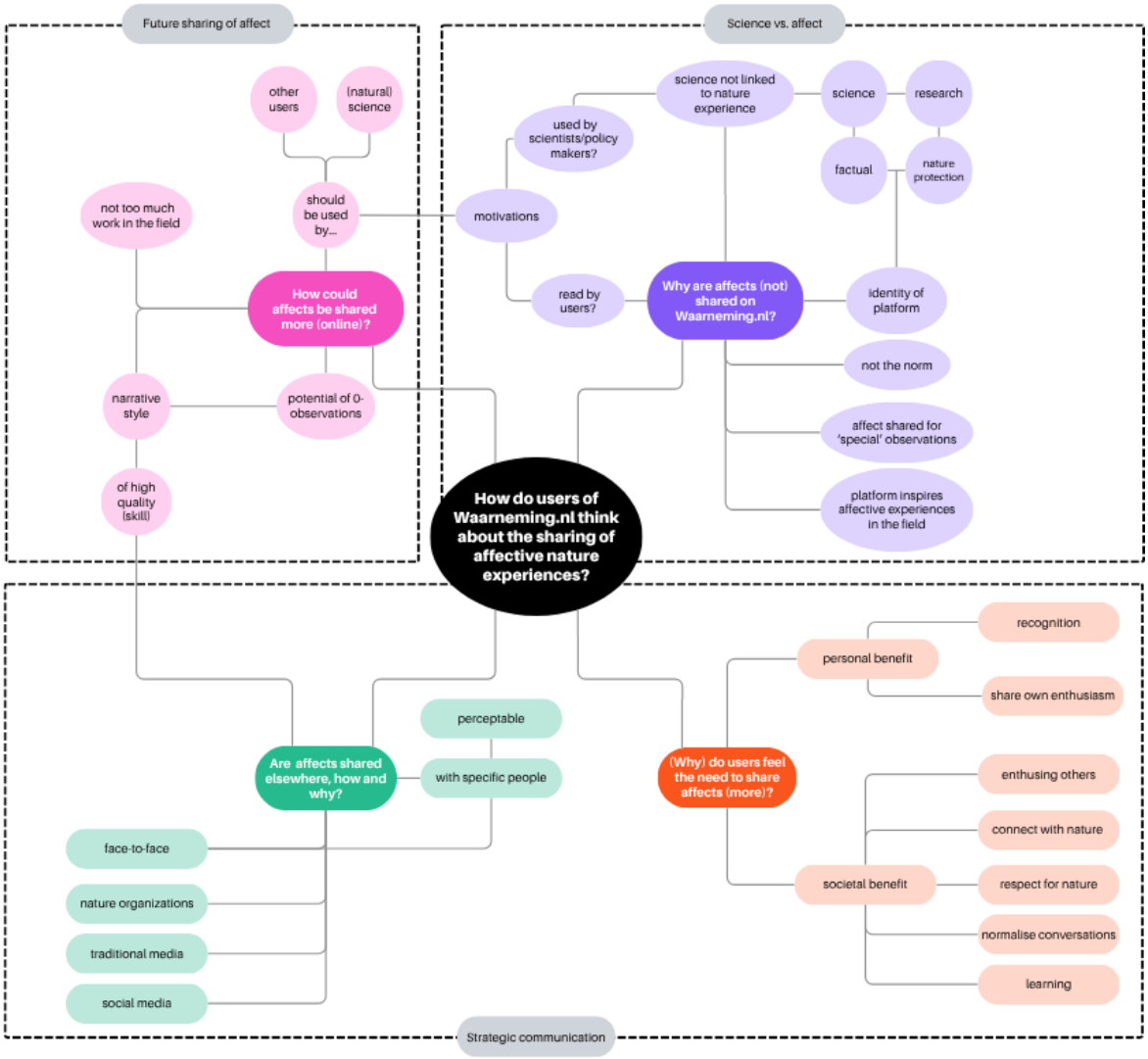

Figure 1. Simplified version of mind map, used to structure and analyze the data from the focus groups. Topics identified from the focus groups structured according to four research questions (in pink, purple, green and orange), as further detailed in the results section. The topics are clustered into themes (see dotted lines and grey headings), as analyzed in the discussion section.

References

Arewasikporn, A., Sturgeon, J. A., & Zautra, A. J. (2018). Sharing Positive Experiences Boosts Resilient Thinking: Everyday Benefits of Social Connection and Positive Emotion in a Community Sample. *American Journal of Community Psychology*, *63*(1–2), 110–121. https://doi.org/10.1002/ajcp.12279

Bareither, C. (2019). Doing Emotion through Digital Media: An Ethnographic Perspective on Media Practices and Emotional Affordances An Ethnographic Perspective on Media Practices and Emotional Affordances. *Ethnologia Europaea*, *49*(1). https://doi.org/10.16995/ee.822

Bennett, W. L., & Segerberg, A. (2012). The logic of connective action: digital media and the personalization of contentious politics. *Information, Communication & Society*, *15*(5), 739–768. https://doi.org/10.1080/1369118x.2012.670661

Boccia Artieri, G., García-Bilbao, P. A., & La Rocca, G. (2021). Rethinking affective polarization and sharing of emotions in digital platform ecosystems. Theories and research practices. *International Review of Sociology*, *31*(2), 223–230. https://doi.org/10.1080/03906701.2021.1947949

Chawla, L. (2020). Childhood nature connection and constructive hope: A review of research on connecting with nature and coping with environmental loss (R. Gould, Ed.). *People and Nature*, *2*(3), 619–642. https://doi.org/10.1002/pan3.10128

Christakis, N. A., & Fowler, J. H. (2009). *Connected*. Brown; Company.

Craps, S. (2020). Climate trauma. In *The Routledge Companion to Literature and Trauma*. Routledge. https://doi.org/10.4324/9781351025225

Cvetkovich, A. (2003). *An Archive of Feelings*. Duke University Press. https://www.dukeupress.edu/An-Archive-of-Feelings

Cyr, J. (2019). *Focus Groups for the Social Science Researcher*. Cambridge University Press. https://doi.org/10.1017/9781316987124

Daston, L. (1995). The Moral Economy of Science. *Osiris*, *Vol. 10, Constructing Knowledge in the History of Science*, 2–24. https://www.jstor.org/stable/301910

Dickinson, J., & Bonney, R. (2012). *Citizen Science: Public Participation in Environmental Research*. Cornell University Press.

Fearnley, C. J. (2022). Mind mapping in qualitative data analysis: Managing interview data in interdisciplinary and multi-sited research projects. *Geo: Geography and Environment*, *9*(1), e00109. https://doi.org/10.1002/geo2.109

Foster, A. (2018). Volunteer Environmental Stewardship and Affective Labour in Philadelphia. *Conservation and Society*, *16*(1), 52. https://doi.org/10.4103/cs.cs_16_49

Ganzevoort, W., & van den Born, R. (2019). The Thrill of Discovery: Significant Nature Experiences Among Biodiversity Citizen Scientists. *Ecopsychology*, *11*(1), 22–32. https://doi.org/10.1089/eco.2018.0062

Ganzevoort, W., & van den Born, R. J. G. (2020). Understanding citizens' action for nature: The profile, motivations and experiences of Dutch nature volunteers. *Journal for Nature Conservation*, *55*, 125824. https://doi.org/10.1016/j.jnc.2020.125824

Ganzevoort, W., & van den Born, R. J. G. (2023). The everyday reality of nature volunteering: an empirical exploration of reasons to stay and reasons to quit. *Journal of Environmental Planning and Management*, *68*(1), 207–226. https://doi.org/10.1080/09640568.2023.2240953

Ganzevoort, W., van den Born, R. J. G., Halffman, W., & Turnhout, S. (2017). Sharing biodiversity data: citizen scientists' concerns and motivations. *Biodiversity and Conservation*, *26*(12), 2821–2837. https://doi.org/10.1007/s10531-017-1391-z

Goldenberg, A., & Gross, J. J. (2020). Digital Emotion Contagion. *Trends in Cognitive Sciences*, *24*(4), 316–328. https://doi.org/10.1016/j.tics.2020.01.009

Gregg, M., & Seigworth, G. J. (2010). *The Affect Theory Reader*. Duke University Press. https://www.dukeupress.edu/the-affect-theory-reader

Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). *Emotional Contagion*. Cambridge University Press. https://doi.org/10.1017/cbo9781139174138

Hermida, A. (2014). *Tell Everyone: Why we share and why it matters*. Penguin. https://www.penguinrandomhouse.ca/books/225849/tell-everyone-by-alfred-hermida/9780385679589

Hochschild, A. R. (1979). Emotion Work, Feeling Rules, and Social Structure. *American Journal of Sociology*, *85*(3), 551–575. https://doi.org/10.1086/227049

Holthaus, L. (2022). Feelings of (eco-) grief and sorrow: climate activists as emotion entrepreneurs. *European Journal of International Relations*, *29*(2), 352–373. https://doi.org/10.1177/13540661221136772

IPBES. (2022). *Methodological assessment report on the diverse values of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (P. Balvanera, U. Pascual, M. Christie, B. Baptiste & D. González-Jiménez, Eds.). IPBES secretariat. Bonn, Germany. https://doi.org/10.5281/zenodo.6522522

Jørgensen, F. A. (2014). The Armchair Traveler's Guide to Digital Environmental Humanities. *Environmental Humanities*, *4*(1), 95–112. https://doi.org/10.1215/22011919-3614944

Lambert, N. M., Gwinn, A. M., Baumeister, R. F., Strachman, A., Washburn, I. J., Gable, S. L., & Fincham, F. D. (2012). A boost of positive affect: The perks of sharing positive experiences. *Journal of Social and Personal Relationships*, *30*(1), 24–43. https://doi.org/10.1177/0265407512449400

Latour, B. (1993). *We have never been modern*. Harvard University Press. https://www.hup.harvard.edu/books/9780674948396

Lockwood, A. (2016). Graphs of grief and other green feelings: the uses of affect in the study of environmental communication. *Environmental Communication*, *10*(6), 734–748. https://doi.org/10.1080/17524032.2016.1205642

Lorimer, J. (2015). *Wildlife in the Anthropocene: Conservation after nature*. University of Minnesota Press. https://www.jstor.org/stable/10.5749/j.ctt14btgjq

Macnaghten, P. (2017). Focus groups as anticipatory methodology: a contribution from science and technology studies towards socially resilient governance. In R. S. Barbour & D. L. Morgan (Eds.), *A New Era in Focus Group Research* (pp. 343–363). Palgrave Macmillan U.K.

Milton, K. (2002). *Loving Nature: Towards an Ecology of Emotion*. Routledge. https://www.routledge.com/Loving-Nature-Towards-an-Ecology-of-Emotion/Milton/p/book/9780415253543

Ojala, M., Cunsolo, A., Ogunbode, C. A., & Middleton, J. (2021). Anxiety, Worry, and Grief in a Time of Environmental and Climate Crisis: A Narrative Review. *Annual Review of Environment and Resources*, *46*(1), 35–58. https://doi.org/10.1146/annurev-environ-012220-022716

Paleco, C., García Peter, S., Salas Seoane, N., Kaufmann, J., & Argyri, P. (2021). Inclusiveness and Diversity in Citizen Science. In *The Science of Citizen Science* (pp. 261–281). Springer International Publishing. https://doi.org/10.1007/978-3-030-58278-4_14

Papacharissi, Z. (2014). *Affective Publics: Sentiment, Technology, and Politics*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199999736.001.0001

Phillips, T. B., Ballard, H. L., Lewenstein, B. V., & Bonney, R. (2019). Engagement in science through citizen science: Moving beyond data collection. *Science Education*, *103*(3), 665–690. https://doi.org/10.1002/sce.21501

Reddy, W. M. (2001). *The Navigation of Feeling: A Framework for the History of Emotions*. Cambridge University Press. https://doi.org/10.1017/cbo9780511512001

Rimé, B. (2007). The Social Sharing of Emotion as an Interface Between Individual and Collective Processes in the Construction of Emotional Climates. *Journal of Social Issues*, *63*(2), 307–322. https://doi.org/10.1111/j.1540-4560.2007.00510.x

Schuttler, S. G., Sorensen, A. E., Jordan, R. C., Cooper, C., & Shwartz, A. (2018). Bridging the nature gap: can citizen science reverse the extinction of experience? *Frontiers in Ecology and the Environment*, *16*(7), 405–411. https://doi.org/10.1002/fee.1826

Serrano-Puche, J. (2019). Affect and the Expression of Emotions on the Internet: An Overview of Current Research. In *Second International Handbook of Internet Research* (pp. 529–547). Springer Netherlands. https://doi.org/10.1007/978-94-024-1555-1_45

Sextus, C. P., Hytten, K. F., & Perry, P. (2024). A Systematic Review of Environmental Volunteer Motivations. *Society & Natural Resources*, *37*(11), 1591–1608. https://doi.org/10.1080/08941920.2024.2381202

Sharma, N., Greaves, S., Siddharthan, A., Anderson, H., Robinson, A., Colucci-Gray, L., Wibowo, A. T., Bostock, H., Salisbury, A., Roberts, S., Slawson, D., & van der Wal, R. (2019). From citizen science to citizen action: analysing the potential for a digital platform to cultivate attachments to nature. *JCOM*, *18*(01), A07. https://doi.org/10.22323/2.18010207

Sherif, M., & Hovland, C. I. (1961). *Social Judgement*. Yale University Press.

Singh, N. M. (2013). The affective labor of growing forests and the becoming of environmental subjects: Rethinking environmentality in Odisha, India. *Geoforum*, *47*, 189–198. https://doi.org/10.1016/j.geoforum.2013.01.010

Singh, N. M. (2018). Introduction: Affective Ecologies and Conservation. *Conservation and Society*, *16*(1), 1. https://doi.org/10.4103/cs.cs_18_33

Skarlatidou, A., Hamilton, A., Vitos, M., & Haklay, M. (2019). What do volunteers want from citizen science technologies? A systematic literature review and best practice guidelines. *JCOM*, *18*(01), A02. https://doi.org/10.22323/2.18010202

Stanton, A. L., & Low, C. A. (2012). Expressing Emotions in Stressful Contexts: Benefits, Moderators, and Mechanisms. *Current Directions in Psychological Science*, *21*(2), 124–128. https://doi.org/10.1177/0963721411434978

Steinert, S., & Dennis, M. J. (2022). Emotions and Digital Well-Being: on Social Media's Emotional Affordances. *Philosophy & Technology*, *35*(2). https://doi.org/10.1007/s13347-022-00530-6

Stevens, T. M., Aarts, N., & Dewulf, A. (2020). Using Emotions to Frame Issues and Identities in Conflict: Farmer Movements on Social Media. *Negotiation and Conflict Management Research*. https://doi.org/10.1111/ncmr.12177

Torres, A.-C., Bedessem, B., Deguines, N., & Fontaine, C. (2022). Online data sharing with virtual social interactions favor scientific and educational successes in a biodiversity citizen science project. *Journal of Responsible Innovation*, *10*(1). https://doi.org/10.1080/23299460.2021.2019970

van Woerkum, C. M. J., & Aarts, M. N. C. (2008). The Orientation of Organizations to their Environments: Functions of the Unconscious Mind. *Journal of Public Relations Research*, *20*(2), 180–206. https://doi.org/10.1080/10627260801894314

Verploegen, H., Ganzevoort, W., & van den Born, R. (2021). Affordances and tensions in recording bird observations: how coordinators and volunteers perceive and experience citizen science in birding. *JCOM*, *20*(02), A10. https://doi.org/10.22323/2.20020210

Verploegen, H., van den Born, R. J. G., & Aarts, N. (2024). Affective Encounters with More-than-humans: Digital Platforms in a Time of Environmental Loss. *Conservation and Society*, *22*(2), 53–62. https://doi.org/10.4103/cs.cs_95_23

Whitney, K. (2013). Tangled up in knots: An emotional ecology of field science. *Emotion, Space and Society*, *6*, 100–107. https://doi.org/10.1016/j.emospa.2011.10.003

About the authors

Helen Verploegen was a PhD candidate at the Institute for Science in Society, Radboud University. Her research revolves around (digital) citizen science and the affective aspects of human-nature relationships.

helenverploegen@gmail.com

Noelle Aarts is professor Socio-Ecological Interactions at the Institute for Science in Society, Radboud University. Her research focuses on the meaning of everyday conversations on tracks of complex change involving nature, agriculture, human-animal relations and the use of land.

noelle.aarts@ru.nl

Irma Arts is postdoctoral researcher at the Institute for Science in Society, Radboud University. Through her inter- and transdisciplinary research she aims to contribute to a sustainable, equitable and nature inclusive society.

irma.arts@ru.nl

Riyan van den Born is associate professor at the Institute for Science in Society, Radboud University. Her work focusses on human-nature relationships, relational values, motivations to act for nature, and the role of citizen science and stakeholder participation in socio-ecological interactions.

riyan.vandenborn@ru.nl

How to cite

Verploegen, H., Aarts, N., Arts, I. and van den Born, R. (2026). 'Where does affect go? Exploring the (online) sharing of affective nature experiences by ecological citizen scientists'. *JCOM* 25(01), A03. https://doi.org/10.22323/1514202512140648O8.

ISSN 1824-2049. Published by SISSA Medialab. jcom.sissa.it