**The art of socio-ecological transformation**

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**Abstract:**

This article uses two artistic case-studies, *Bird Yarns* (a knitting collective engaging questions of climate change) and *SLOW Cleanup* (an artist-driven environmental remediation project) to examine the “work” art can do with respect to socio-ecological transformations. We consider these cases in the context of geography’s recent interest in “active experimentations and anticipatory interventions” in the face of the challenges posed by the environmental and social uncertainties of the Anthropocene. We propose two dimensions to the force of art with respect to these concerns. First, that it provides a site and set of practices from which scientists, artists and communities can come to recognize as well as transform relations between humans and nonhumans. Second, that it encourages an accounting of the constitutive force of matter and things with implications for politics and knowledge production. Through these two dimensions, we explore how the arts can enable forms of socio-ecological transformation, and further, how things might be different in the future, enabling us to explore how, who, and what might play a part in defining and moving towards such a future.

Key Words: Art, socio-ecological, imaginary, matter, publics

**Introduction**

What might it mean to consider socio-ecological transformations and futures from a perspective that deploys an expanded appreciation of the social, one that incorporates the “lively processes and impure forms coexisting in inhabited landscapes” (Lorimer 2012, 594)? Such a foundational question poses significant challenges to the politics, knowledge and imaginations of socio-ecological futures. One challenge is how might we imagine and bring about a recognition of ecology and its particular temporalities – less as an interaction between pre-ordained life forms, than of their emergence and transformation in a “wider field of forces, intensities and durations that give rise to [them]’ (Ansell-Pearson, cited in Whatmore 2013, 36). How, in short, do we develop an orientation “not towards conservation, because the world never holds still, but to the possibilities and consequences of a ‘new earth’ and a ‘new humanity’ that is still to come” (Braun 2006, 219)? A second challenge is how to research and write about such worldly liveliness and disseminate the results among the full range of “publics” and “experts” (principally scientists) upon whose knowledge the performance and enactment of socio-ecological futures rests.

These challenges have become increasingly urgent, and increasingly foregrounded, in discussions around the Anthropocene; that current geologic era of human-driven environmental and social uncertainty (Lorimer 2012; Johnson and Morehouse 2014). But thinking through these complex materialities and vital forces, and their temporalities, let alone making space for them within expert – often scientific – knowledge making practices, is not easy. Indeed, it is not enough to move beyond the binary of “modern” thinking – e.g. nature/culture – to make sense and take account of such vital forces and differences – from animals, to microbes, to the liveliness of inorganic, geologic and atmospheric forces for example. In addition, we must develop modes of knowledge production that are able to meet the epistemological, ontological and political challenges accompanying such accountings.

Geographers have responded to these calls with a turn towards inter- and intra-disciplinarity, developing creative solutions, including “active experimentations and anticipatory interventions” in collaboration with a range of scientists and publics (Lorimer 2012, 599). In this paper we present two case studies, part of a wider set of ethnographies of art–science projects, that provide complementary accounts of how artistic practices might contribute to this emerging suite of experiments and interventions.[[1]](#endnote-1) In doing so we contend that such intellectual concerns with the complex materialities and forces within and through which we live possess the potential to foster political and ethical relationships that might constitute “us” and our collective futures differently.

Art has long offered geographers empirical objects through which to theorize nature and society-environment relations, through paintings, installations and land-art (Daniels 1993; Gandy 1997), and more recently art-science collaborations (Dixon et al. 2013). We add to this area of inquiry by examining two “socially-engaged” art works, *Bird Yarns* (2012) (Figure 1)*,* a collective knitting project in Scotland, and *SLOW Cleanup* (2010) (Figure 2), a Chicago-based, artist-driven environmental remediation project.

INSERT FIGURE ONE IN HERE

While geographers have recognized the social force of arts practices in not only reproducing worlds but also in constituting them (Daniels 1993), the last few decades of seemingly exponential growth in socially-engaged art have resulted in further interest and scholarship. Engaging with art as a “technology of connection,” geographers have studied how it can constitute human social encounters that do particular types of “work” in the world. This work might include healing communities torn apart by conflict or connecting fractured urban communities contending with urban “super-diversity” (Hawkins 2014). Art theorists interested in this recent growth have indicated the need to investigate the form and kind of social relations these art works constitute, to challenge their instrumentalized politics, and to reflect on their reconfiguration of aesthetics (Bishop 2004; Kester 2011). Among these discussions however, the social has largely been mobilized as a human-centric concept, and the encounters explored chiefly those between humans. Here we seek to expand this idea of the social to include the more-than-human. We investigate how the social relations constituted in our two cases unfold between humans and non-humans alike. We further consider how such relations might be understood to expose the liveliness of the world, and in doing so assemble new types of collectives that participate in the making of our socio-ecological futures. Ahead of our empirical discussions, we outline the experimental and interventional strategies that geographers have recently been adopting to account for vital matter and forces in our socio-ecological thinking.

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**Towards Aesthetic Experiments and Interventions**

It is, by now, understood that to specify the presence of nonhumans, or simply to acknowledge the animate matter and forces of the physical worlds in which we live, is not enough. As Paulson (2001, 112) writes, the crucial point is to learn how “new types of encounter (and conviviality) with nonhumans… can give rise to new modes of relation… to new political practices” and, we would add, to new knowledge making practices. A range of responses have been offered by way of experimenting with science and arts practices and theoretical vocabularies, to begin to specify how we might formulate ethico-political conduct akin to these expanded socials. Latour (2004), for example, seeks to understand how we might “learn to be affected” in order to build relations with inanimate objects and nonhumans. At the same time, Haraway (2008) calls for a “response-ability,” detailing a politico-ethico stance that is propagated from an acknowledgement of the force of humans and nonhumans, and organic and inorganic things. Such approaches have gained momentum with the rise of Anthropocene scholarship. This work foregrounds not only the negotiation of the difficulties of alliance-building among human constituencies, but also requires that we account for “deliberations between multiple forms of agency, expertise and subjectivity – some of which are human, some of which require tuning into the diverse becomings of nonhuman forms and processes” (Lorimer and Driessen 2013, 3). Further, the Anthropocene framing of these discussion has emphasized questions of temporality and the practice of not just living with difference but taking account of it in the co-fabrication of immanent, indeterminable and speculative worlds and futures to come (Lorimer, 2012, Johnson and Morehouse, 2014).

In response, scholars including geographers, are evoking languages and practices of experiment, intervention and anticipation. As such, a critical space is being opened for experimental social-ecological practices and politics, wherein “anticipatory interventions” are celebrated in the exploration and bringing about of “experimental and emergent futures” (Lorimer 2012, 599, 601). These are avowedly political projects, that among other things, seek to foster us as experimental researchers through a call for “hybrid research collectives” that “un-perform dualisms” (Gibson-Graham and Rolevink, 2009), and assert the potential of the sensing body as a site from which to begin addressing environmental ethics.

While practices such as citizen science (Gross 2010) and ideas such as Stenger’s competency groups (Whatmore and Landström 2011) have become the normative register for such experimental endeavours and interventions, there is an emerging role for art and aesthetic practices more broadly. Born and Barry (2010), for example, note the potential of art-science practices as public experiments that, rather than *translating* science for an assembled public, *transform* art, science and the public. In a different vein, geographers have explored forms of writing and image-making as enabling encounters with nonhumans drawing on ideas of response-abilities or a learning to be affected (Braun 2005; Hinchliffe et al.2005; Lorimer 2010). Perhaps more common however, is geographical scholarship that turns to art to explore the place of humans within the complex worlds that constitute them. Geographical studies of land art have long been grounded by such ideas (Matless and Revill 1995; Gabrys and Yusoff 2011; Hawkins 2013), but recent studies of post-human aesthetics (Dixon et al.2013) consolidate this approach as a promising direction for further study.

In making sense of bioart, Dixon quotes Whatmore to underscore how such works might cultivate relations toward all manner of “social objects and forces assembled through and involved in the co-fabrication of socio-material worlds” (Whatmore 2006, 603-4 cited in Dixon 2009, 414). Exploring arts practices as sites for the suspension of “the ordinary coordinates of sensory experience”, Dixon, like Gabrys and Yusoff (2012), draws on Rancière’s theories of aesthetics and politics to recognize the force of arts practices to “create new modes of sense perception that would realign and resituate natural-cultural relations” (2012, 18). In their exploration of climate change imaginaries, they assert the potential of art for making, imagining, contesting, and living in shared material and affective worlds. While agreeing wholeheartedly with the sensibility of these studies, however, we find Rancière less useful in terms of exploring art’s potential to cultivate imaginaries of shared worlds and collective actions. Our issue lies in the limits we find in his polity. For, as useful as his thinking may be to politics, aesthetics and the human, it falls short in accounting for the nonhuman that is absent from his fully human-centred politics.

We resist analyzing our cases through the generalized theories of aesthetic work that geographers have often deployed to understand the “work” art does. Instead, we explore the heterogeneous bits and pieces of the lively worlds of difference that compose any artwork and its polity (Marston et al. 2005). Opening up the connections and redistributions of matter, objects, and expertise the art works bring about, enables us to query how they might contribute to socio-ecological transformation and the potential for propagating alternative futures. We begin with *Birdyarns* reflecting on the knitting needles, patterns, wool, other yarns, and bits of plastic, as well as the production of the knitted birds and their display. Through these nonhuman objects we probe the potential for aesthetics to engage us with lived worlds of difference. By refusing the analytic separation of spheres of life, we are forced to confront difference differently, asking not only what forms of difference matter, but also who decides. We take up this point in the second case, *SLOW Cleanup*,which directs us to investigate the spaces and practices of science and the role of the scientist as representative of nonhuman constituencies.

**Rematerializing imaginaries of climate change**

Birdyarns is gathering supporters and followers with each and every landing, each time making connections in new, exciting and unexpected ways… it seems that their gentle activism is engaging new audiences both for *Birdyarns* and Cape Farewell in a cultural (and knitted) response to climate change.[[2]](#endnote-2)

Discussions of the forming of social connections and the resulting “gentle activism” are common in *Birdyarns*, an on-going project to knit collectively a flock of Arctic Terns. As artist Deidre Nelson describes, the “landing” of the knitted flock of “lost” terns in various locations around Scotland, England and Nova Scotia, produces “talk” about the disturbance in seabird migration patterns due to climate change. This participatory project, originating from the island of Mull, Scotland, and funded by the U.K. based art-climate change organization Cape Farewell, was first displayed on wire strung along the island’s harbor (Figure 3). It has evolved into an international network of knitters linked through a website as well as the global circulation of materials, patterns and finished knitted birds.

INSERT FIGURE THREE HERE

At first glance, *Birdyarns* appears to be a classic socially-engaged arts project, mobilizing craft theories of “making-is-connecting” wherein collective material-making practices are understood to foster social bonds (Gauntlett 2013). *Birdyarns* promoted social encounters between humans – initially Mull’s Woolly Wednesdays knitting group – spreading by word-of-mouth across the islands, then throughout mainland Scotland and finally going viral on the internet, via Twitter, Facebook and Tumblr. These virtual landings of the birds described above, soon resulted in flock visits to various art galleries around the United Kingdom and Nova Scotia, fostering an international network of knitters.

At each of the landings, audiences encounter both knitted terns and an expert narrative, a spoken-word soundtrack written by an ornithologist and narrated by a local wildlife photographer. The observable effects of climate change are storied here through tales of changed avian lives, broken habits of nutrition and dwelling, and re-routed migration paths that take material form in the changed bodies of birds. As such, *Birdyarns* tells a story of a charismatic species as a rallying point for environmental awareness and action (Lorimer 2006). Terns become akin to polar-bears or penguins, those more classic examples of how species become icons for environmental awareness as images, stories, and myths accumulate around them.

Alongside assembling a human flock, the social encounters catalyzed by *Birdyarns* were also of a human-nonhuman variety. Climate change is often considered a “collective experiment” that overspills the confines of the lab and requires that we acknowledge an assembly of new (human) publics, also recognizing the expanded ecologies and material conditions that are integral to its politicalities (Gabrys and Yusoff 2012). If making is indeed connecting, then the question of what is being made and what is being connected in *Birdyarns* becomes an important one. The answer, we contend, is the production of shared material and affective environments that enables a different imaginary of earthly and atmospheric collectivities than one focused on scientific fact and scaled at the global level. In the case of *Birdyarns*, this is a material imaginary that foregrounded situated matter, forces, and atmospheres as much as it engaged with a locally common species of bird.

The first instance in which we see these engagements with worldly matter is in how the making of the birds connected the fleshy corporealities of the knitters with the woolly bodies of the birds they produced. Working from a pattern and with wool from the island’s sheep, knitters form the body of the bird, knitting head, shaping body and forming its black cap from rows of stitches. They then sew them together and wash them to soften the wool, and finally stuff the knitted forms “with local fleece if possible.” Local knitters were invited to beachcomb for red plastics for the wings and beaks; those not on the island were encouraged in the knitting instructions to “use red threads of yarn, or found plastics – use what you have, recycle if you can.”[[3]](#endnote-3)

The shaping of birds’ woolly bodies, sculpted through the repetitive practices of manipulating wooden needles and spun yarn in variously experienced hands, catalyzed interactions-in-the-making, connecting the fleshy bodies of the birds, their knitted form and the corporealities of the knitters. This connection is manifest in the care and concern the knitters expressed for the fate of their woolly terns in the harsh island weather. We want to go further, though, to suggest that these connections knitted together through matter, are also ones that register a material imaginary of climate change that exceeds mundane relationships between humans and birds.

*Bird Yarns* offered knitters – and, in part, the local community – the chance to register a different imaginary of earthly and atmospheric collectivities than one focused on scientific fact. This imaginary propagated not only from the materialities and doings of knitting, but also from the changing morphologies of the knitted bird bodies. These deformed avian corporealities were a function of the simplicity of the pattern (designed to be accessible), the varying skills of the knitters (from inexperienced novice to skilled amateurs and professionals), and the island weather conditions. But their deformation acted in two ways. First, they became part of a science-based narration concerning changes to body morphology as birds fly increased distances on less food due to climate-induced ecosystem change. As Nelson notes:

People have…been like ‘oh they look more like oyster catchers’... and I’ve been saying . . . ‘well you know they are changing because they are not eating the same food and they are travelling shorter’ and you know ‘they have landed here’ and … Dawn has been going ‘they have been at the chip van, they are eating rubbish that you are leaving lying around’... it can be a way to sort of… engage people in sometimes quite serious issues (Interview 22/06/2012).

Whether the woolly birds look like Arctic Terns, or whether the science was correct, was less important than how the deformed knitted morphologies stimulated discussion of “serious issues.” Second, the fabricated bird forms became a barometer of sorts, attuning minds to the varying severity of local weather conditions and encouraging a conscious or unconscious registering of the inter-relations of the common fleshy materiality of bird bodies, human bodies, and the elemental forces that constitute weather and climate.

Those knitting the birds worried in blog posts over “how they would fare with island weather,” at the same time that local people became attached to the birds, expressing concern that they “must be cold” out there and joking about “getting a hair dryer to dry them off” (Interview 22/06/2012). Constant exposure to the elements changed their knitted forms, felting the wool, altering their materiality, as Nelson noted: “if we keep exhibiting them outdoors at different venues they will keep changing” (Interview 22/06/2012).

In the transformation of knitted stitch to felted fabric by elemental exposure, *Birdyarns* conjures climate imaginaries based around forces and material transformations. Knitted birds become a prompt to engage with environmental change less as matters of scientific fact and more as forces affecting more-than-human collectives. The geographies of this climate change imaginary are refigured too. In place of climate change as an “out there,” distributed across a global imaginary of distant places, *Birdyarns* localizes and materializes climate change. Epic narratives of heating and cooling, of ice and sea level rise are replaced by a situation of climate change closer to home. These narratives are given form in the migratory birds whose annual pilgrimages have long punctuated island life, and even the perhaps more prosaic imaginaries that assert a corporeality in common that renders birds and humans alike vulnerable to dramatically changing weather conditions.

**A Politics of Knowledge Production**

*SLOW Cleanup* is a Chicago-based environmental remediation project convened by the artist Frances Whitehead in collaboration with grasses, bees, flowers, and a host of environment science students, urban planners, and remediation scientists. Focusing on a test site on Chicago’s South Side, *SLOW Cleanup* brings about environmental transformations, both the cleaning of chemical contaminants from one of the city’s many abandoned gas stations, and the return of the abandoned land to productive social (read here human and nonhuman) functions. The project also, we argue, realigns the political economies of the production of what counts as ecological science.  We make sense of this through a grammar of science and technology studies that enables us to address sites of ontological perturbation such as Callon’s (1998) “hot situations,” Latour’s (2005) “matters of concern,” or Stenger’s (2005) “things that force thought.” Under these rubrics, *SLOW Cleanup* renders the environmental remediation process a generative event in which expert thinking was forced to “slow down” and a space for reasoning differently is opened up, enrolling those affected (human and nonhuman) in new political opportunities and associations.

If such sites of ontological perturbation are often those of techno-science or of catastrophic, controversial events (Stengers 2005; Whatmore 2013), *SLOW Cleanup,* while driven by less spectacular circumstances, is no less situated amid political economies of science. Abandoned gas station lots scattered across Chicago represent continuing challenges to that city’s Brownfield Initiative, which since its inception in 1993, has encouraged partnerships with developers to clean-up small, widely distributed sites and to redevelop them in ways beneficial to surrounding neighborhoods. The initiative, although successful elsewhere in Chicago – as one of Whitehead’s collaborators notes, “phytoremediation is big business”– has been less so in more impoverished areas, where, without real estate investment, remediation remains elusive (Higgins 2008).

Responding to the polluted soil and social deprivation that shapes these sites, Whitehead, a professor of sculpture at the Art Institute of Chicago, submitted a proposal to the Chicago Department of Environment’s Embedded Artist Project to experiment with new approaches to remediation for impoverished areas. In the course of her project Whitehead generated a collective of nonhumans alongside artists, scientists, students and planners. In doing so *SLOW CleanUp*:

catalyzes a regime of thought and feeling that bestows the power on that around which there is a gathering to become a cause for thinking… A presence that transforms each protagonist’s relations to his or her own knowledge… and allows the whole to generate what each one would have been unable to produce separately (Stengers 2005, 1002).

If *Birdyarns* provides an example of how the “work” of art might open us to the forces and matter of the world, then Whitehead’s project augments this by suggesting how taking account of non-humans might just open us to different environmental futures. In response to the challenge of environmental remediation Whitehead, we want to argue, creates a collective in which no single body of knowledge is sufficient. What emerges is a set of practices in which the issue – in this case, environmental remediation – gains the power to “activate thinking,” a thinking that belongs to no one agent and in which no-one is right. Collective thinking about environmental remediation proceeds, we argue, in the course of the project by way of acknowledging the presence of those who might otherwise be disqualified as having nothing to propose, producing as a result an emergent common account.

The workings of Whitehead’s collective thus transformed the old gas-station site from a locus of persistent environmental problems into a generative space where the redistribution of knowledge and expertise occurred, and constitution of publics and the political were enlarged in practically and conceptually productive ways (Marres and Lezaun 2011; Whatmore and Landström 2011; Ingram 2012). As Paul Schwab, a soil chemist at Purdue University and one of the collaborating scientists noted:

I’ve worked on a lot of remediation sites and none of them particularly nice to look at, and this one is different, so aesthetic. But that is the whole point of Frances being involved, trying to avoid the engineered straight rows and grasses that are known remediators with a different endpoint entirely (Interview 8/9/2011).

In challenging scientists to think beyond “known remediators,” disordering conditions are fostered as their expert reasoning is forced to slow-down, creating opportunities to arouse “a different awareness of the problems and situations that mobilize us” (Stengers 2005, 994). In doing so, a number of things, not least those expert knowledge claims hardwired in the scientific practices of remediation, become the subject of political interrogation.

The urban setting of *SLOW Cleanup* challenged standard phytoremediation species, normally comprised of tall grasses and agricultural plants, hardly ideal for a small inner city plot. Furthermore Whitehead had a series of goals that exceeded those of remediation science. Thus began a year of lab and site-based experimentation in which the scientists went back to the drawing board after Whitehead rejected all the grasses that were their go-to choices. She turned instead to expand the range of plants. Schwab notes:

We worked together in terms of strategizing what should go in there in terms of plant species.  On top of that [the remediation] she also has a number of scenarios she wanted to create, urban agriculture involving things that you could eat such as fruit or gardens… a bird sanctuary, and others that would be purely aesthetic. . . she had all kinds of things she was working on, and hundreds of species came rolling out of this (Interview 8/9/2011).

Compiling research, assembling spread-sheets, and establishing greenhouse trials and test plots, Whitehead and Schwab, with assistance from Chicago State University environmental science students, successfully identified twelve new plant species able to manage and survive contamination and carry out other functions. Some species, for example, chemically dismantle large soil hydrocarbons in the root zone and simultaneously co-create a garden that blooms as a seasonal clock, forming a resource and an attractive landscape for humans and nonhumans alike (Figure 4).

INSERT FIGURE FOUR IN HERE

On the face of it, the publics and the forms of participation that *SLOW Cleanup* produces are different from those of *Birdyarns*. In *SLOW Cleanup,* the local community – in human terms at least – is largely left out of expert discussion, as well as the larger collective that Whitehead composes. Instead akin to “traditional” public art projects, the result is an aesthetic object (the garden) to be experienced by a (human) community that has had little involvement in its production. Significantly, however, the experiment of *SLOW Cleanup*, insists that we specify more precisely than is perhaps normal with participatory arts projects, who (and what) participates in this ecological remediation, and whom does it serve? In forcing us to engage these questions, *SLOW Cleanup* challenges and reconstitutes ecological science and art in relation to an expanded set of participants. It develops a collective, calling upon a widening circle of participants including an expanded community of plant species who bring new forms of remediative expertise to the project. What is at stake here is a redistribution of knowledge through multiple forms of expertise, whose outcomes offer a substantive challenge to conventional knowledge frameworks and technologies coded in the manuals and guides of urban brownfield remediation.

**Conclusion**

The environmental and social uncertainties of the Anthropocene, together with scholarship on the more-than-human, provide an impetus to expand the idea of the social in our understandings of socio-ecological transformations. Further, we are enjoined to take seriously the opportunities that such re-conceived ideas of the socio-ecological present for normative understandings of spaces, practices and participants in knowledge-making and political processes. Experimental and interventionary strategies have become an important way to approach these openings and in this article we have made a case for the value of artistic practices as part of these strategies.

In *Birdyarns* and *SLOW Cleanup,* we considered the work art can do in bringing about forms of socio-ecological transformation. Further, we explored how these projects expose who and what might play a part in defining and moving towards alternative futures and how this might be accomplished. Our discussion suggests this process of discernment happens in two ways. First, by recognizing that arts practices are able to make connections, between humans and humans, humans and nonhumans, and between the matter and forces “out there” in the world and those more personal and local imaginaries. Considering intersections of the flock of birds and the distributed flock of human makers, *Birdyarns* enabled an imaginary that localized the global collective experiment of climate change and the transcendental imaginaries of climate science. Second, by takingseriously the challenges that such worldly livelinesses pose to normative modes of politics and the practices of knowledge making, *SLOW Cleanup* provides us with an example of how artistic practices both disturb and subsequently redistribute power and knowledge. As such, normative ecological science practices are re-ordered to take account of multiple expertise and the enrolment of human and nonhuman actors in experiments in environmental remediation.

In addition to enabling us to consider the production of collective socio-ecological futures, our two cases highlight further potentially fruitful engagements between geography and art. As the introduction outlined, art theorists exploring contemporary socially-engaged art such as *Birdyarns* and *SLOW Cleanup*, focus on questions concerning the type and effect of the social relations these art projects produce. Their work often assumes a human social, but as our discussion illuminates, the social of socially-engaged art can be as much nonhuman as human. In our cases, the encounters that were formed brought together humans and nonhumans in manifold ways, but more than this, as *SLOW Cleanup* demonstrates, the “publics” *of* and *for* these works, brought into being by them, were as much nonhuman as they were human. This is not the place to belabor the point, but it is worth noting that geographical perspectives on nonhuman socials, have much to add to, and much more to learn from, those concerned with art and aesthetics.

Reprising the claims the article opened with, and following Braun and Whatmore (2010), we contend that without an ontology that accounts for human-non-human collectives we are unable to explore new capacities or to reflect seriously on how we could be different than we currently are. Our discussions have reflected on how art works do not merely allow the nonhuman into political constituencies, but also enable us to examine what is distinctive about doing so. In short, to acknowledge that: “it is not only subject-bodies but other materialities that may be at work in the emergence of politicalities” (Woodward et al. 2009, 275). With the redistribution of the political to mundane spaces including the harbour, the knitting circle, the home, the village hall, their disorderly operations required a rethinking of the logics of publics and participation at stake when art is “contributing to the generation of something new within scientific practice itself, challenging the boundaries of disciplinary authority” (Born and Barry 2010, 114). What is perhaps encouraging about efforts such as *Birdyarns* and *SLOW Cleanup* is how these expanded socials allow for the possibility that unconventional collectives might give rise to the imagination and articulation of new political practices and futures.

Notes

1. The empirical material upon which this article is based is drawn from ethnographies of art-science collaborations conducted by the authors between

   01/2012 and 10/2013. They involved participant observation and action and interviews with those involved. See xxx [web address removed for peer-review] [↑](#endnote-ref-1)
2. Cape Farewell website: http://www.capefarewell.com/ (last accessed 21st May 2014). [↑](#endnote-ref-2)
3. *Birdyarns* knitting kit instructions, authors’ own.

   Figure Captions:

   Figure 1: *Bird Yarns* (on the wire) Deidre Nelson (2012) (Photograph: Authors’ own).

   Figure 2: *SLOW Cleanup* (the site) Frances Whitehead (2010- ) (Photgo Courtesy of the Artist)

   Figure 3: *Bird Yarns* (detail) Deidre Nelson (2012) (Photograph: Authors’ own).

   Figure 4: *SLOW Cleanup* (the plan) Frances Whitehead (2010- ) (Image: Courtesy of the Artist)

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