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## Citizen sensing and ontopolitics in the anthropocene

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## 41. CITIZEN SENSING AND ONTOPOLITICS IN THE ANTHROPOCENE: ENGAGING WITH COVID-19 AND CLIMATE CHANGE

MARIE-CATHERINE PETERSMANN<sup>1</sup> & ANNA BERTI SUMAN

Over the past weeks, a plethora of articles explored the relations<sup>2</sup> between the COVID-19 crisis and the climate catastrophe by framing the former as an opportunity to learn lessons for tackling the latter.<sup>3</sup> Among the articles was an essay by Bruno Latour, inviting us to address the current pandemic as a “dress rehearsal” that incites us to prepare for climate change.<sup>4</sup> Elsewhere, Latour argued that the pandemic had “actually proven that it is possible, in a few weeks, to put an economic system on hold everywhere in the world and at the same time, a system that we were told it was impossible to slow down or redirect.”<sup>5</sup> Yet, despite the fact that both events constitute globally shared “collective” experiences, immediate societal responses to them vary greatly. While both events have their causes and effects entwined, their different spatio-temporal scales and socio-ecological implications make socio-political responses to them difficult to compare. Of course, this is not to say that links between the two events do not exist. The outbreak of the zoonotic<sup>6</sup> COVID-19 is entangled with multiple<sup>7</sup> and often interacting “threats to ecosystems and wildlife, including habitat loss, illegal trade, pollution, invasive species and, increasingly, climate change.”<sup>8</sup>

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- 1 This publication has benefited from the financial support of the Swiss National Science Foundation (SNF) through the author’s Early Postdoc Mobility Fellowship (grant P2SKP1\_187639).
  - 2 ‘COVID-19 and the Environment’, *Geneva Environment Network*, 19 October 2020, <https://www.genevaenvironmentnetwork.org/covid19.html>.
  - 3 Dina Townsend, ‘What to Read: COVID-19, Human Rights and the Environment’, *GNHRE*, 30 March 2020, <https://gnhre.org/2020/03/30/what-to-read-covid-19-human-rights-and-the-environment/>.
  - 4 Bruno Latour, ‘Is This a Dress Rehearsal?’, *Critical Inquiry*, 26 March 2020, <https://critinq.wordpress.com/2020/03/26/is-this-a-dress-rehearsal/>.
  - 5 Bruno Latour, ‘What Protective Measures Can You Think of So We Don’t Go Back to the Pre-crisis Production Model?’, 29 March 2020, [www.bruno-latour.fr/sites/default/files/downloads/P-202-AOC-ENGLISH\\_1.pdf](http://www.bruno-latour.fr/sites/default/files/downloads/P-202-AOC-ENGLISH_1.pdf).
  - 6 Olivier Restif, ‘Coronavirus: Three Misconceptions About How Animals Transmit Diseases Debunked’, *The Conversation*, 16 April 2020, <https://theconversation.com/coronavirus-three-misconceptions-about-how-animals-transmit-diseases-debunked-134485>.
  - 7 John Vidal, ‘Tip of the iceberg’: Is Our Destruction of Nature Responsible for Covid-19?, *The Guardian*, 18 March 2020, <https://www.theguardian.com/environment/2020/mar/18/tip-of-the-iceberg-is-our-destruction-of-nature-responsible-for-covid-19-aoe>.
  - 8 ‘Coronavirus Outbreak Highlights Need to Address Threats to Ecosystems and Wildlife’, *UN Environment*, 3 March 2020, <https://www.unenvironment.org/news-and-stories/story/coronavirus-outbreak-highlights-need-address-threats-ecosystems-and-wildlife>.

## Impacts

On a positive note, we observed a widely shared enthusiasm among the climate scientific community when the measurements<sup>9</sup> of the European Copernicus agency registered an unusual drop in nitrogen dioxide levels in February 2020, as analysed by NASA's ground observation team. COVID-19 is indeed set to have caused the "largest ever annual fall in CO<sub>2</sub> emissions",<sup>10</sup> more than during any previous economic crisis or period of war. Studies<sup>11</sup> also showed, inversely, that low levels of air pollution may be a way to prevent COVID-19 deaths.<sup>12</sup> Finally, the plunging demand for oil brought by the COVID-19 was said to have permanently altered the course of the climate catastrophe.<sup>13</sup> As a result, after 2019 being coined "the year of climate consciousness"<sup>14</sup> with a "growing momentum"<sup>15</sup> for climate activism, the current drop of atmospheric pollution was welcomed by many.

Caution<sup>16</sup> was, however, voiced by those who pleaded for more nuance<sup>17</sup>, and requested we refrain from granting agency to the virus itself, pointing instead to the temporary retreat from capitalism's "industrial production and its handmaidens" to explain the current low emissions.<sup>18</sup> Although praised by many as a "catalyst for transformation"<sup>19</sup> that brings about

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- 9 Rafael Cereceda, 'NASA Confirms a Fall in Greenhouse Gas Emissions in China Amid Coronavirus Outbreak', *Euronews*, 4 March 2020, <https://www.euronews.com/2020/03/04/nasa-confirms-a-fall-in-greenhouse-gas-emissions-in-china-amid-coronavirus-outbreak>.
  - 10 Simon Evans, 'Analysis: Coronavirus Set to Cause Largest Ever Annual Fall in CO<sub>2</sub> Emissions', *CarbonBrief*, 9 April 2020, <https://www.carbonbrief.org/analysis-coronavirus-set-to-cause-largest-ever-annual-fall-in-co2-emissions>.
  - 11 Damian Carrington, 'Coronavirus Detected on Particles of Air Pollution', *The Guardian*, 24 April 2020, [https://www.theguardian.com/environment/2020/apr/24/coronavirus-detected-particles-air-pollution?CMP=share\\_btn\\_fb&fbclid=IwAR2Yp-U4H1unF8MwYoveoEF-aoFprvwn37ES1XfHHgXTkqQsWIKQamd3I](https://www.theguardian.com/environment/2020/apr/24/coronavirus-detected-particles-air-pollution?CMP=share_btn_fb&fbclid=IwAR2Yp-U4H1unF8MwYoveoEF-aoFprvwn37ES1XfHHgXTkqQsWIKQamd3I).
  - 12 Damian Carrington, 'Air Pollution May Be 'Key Contributor' to Covid-19 Deaths – Study', *The Guardian*, 20 April 2020, <https://www.theguardian.com/environment/2020/apr/20/air-pollution-may-be-key-contributor-to-covid-19-deaths-study>.
  - 13 Damian Carrington, Jillian Ambrose and Matthew Taylor, 'Will the Coronavirus Kill the Oil Industry and Help Save the Climate?', *The Guardian*, 1 April 2020, [https://www.theguardian.com/environment/2020/apr/01/the-fossil-fuel-industry-is-broken-will-a-cleaner-climate-be-the-result?fbclid=IwAR2iCvJa2oQldll-88VEqvSBCQEa073rxknT8DF6qM\\_a8SsAN9VklFg6toQ](https://www.theguardian.com/environment/2020/apr/01/the-fossil-fuel-industry-is-broken-will-a-cleaner-climate-be-the-result?fbclid=IwAR2iCvJa2oQldll-88VEqvSBCQEa073rxknT8DF6qM_a8SsAN9VklFg6toQ).
  - 14 Anne-Sophie Brändlin, '2019: The Year of Climate Consciousness', *Deutsche Welle*, 27 December 2019, <https://www.dw.com/en/2019-the-year-of-climate-consciousness-wildfires-fridays-for-future-climate-emergency-a-51719968/a-51719968>.
  - 15 Fiona Harvey, "'Momentum is Growing': Reasons to Be Hopeful About the Environment in 2019", *The Guardian*, 2 January 2019, <https://www.theguardian.com/environment/2019/jan/02/climate-change-environment-2019-future-reasons-hope>.
  - 16 Phil Hammond, 'Nature Is Not Sending Us a Message', *Areo Magazine*, 2 April 2020, <https://areomagazine.com/2020/04/02/nature-is-not-sending-us-a-message/>.
  - 17 François Gemenne, 'Habiter la Terre au Temps des Pandémies', *AOC*, 10 April 2020, <https://aoc.media/opinion/2020/04/09/habiter-la-terre-au-temps-des-pandemies/>.
  - 18 Joshua Clover, 'The Rise and Fall of Biopolitics: A Response to Bruno Latour', *Critical Inquiry*, 29 March 2020, <https://critinq.wordpress.com/2020/03/29/the-rise-and-fall-of-biopolitics-a-response-to-bruno-latour/>.
  - 19 Daniel Christian Wahl, 'Phase Shift has arrived! The Pandemic as a catalyst for transformation', *Medium*, 11 March 2020, <https://medium.com/age-of-awareness/phase-shift-has-arrived-who-declares->

“an unprecedented opportunity to rethink how our beliefs, values, and institutions shape our relationships”<sup>20</sup>, on the long run, the economic crisis triggered by COVID-19 may well lead to a suspension of adopted and prospective climate measures.<sup>21</sup> Circular economists and de-growth advocates also pointed to the short-term risks that the pandemic may have triggered by increasing the use of private transportation means and the consumption of single-use plastic products.<sup>22</sup> This has led cities such as Amsterdam to pro-actively consider the “doughnut” model to mend the post-COVID-19 economy<sup>23</sup>, bearing in mind that “calls for solidarity with the weak and disadvantaged must be part and parcel of [such] shifts.”<sup>24</sup>

Even in a world that has come to a halt, we still fall short of the emission targets needed to keep global warming from surpassing 1.5 degrees Celsius above pre-industrial levels. Our failure shows the structural and systemic<sup>25</sup> deficiencies we need to deal with and signals “how much further there is to go.”<sup>26</sup>

## Towards Sensing Engagement

Whether or not the COVID-19 crisis will be beneficial for tackling climate change in the long run (beyond the immediate drop in atmospheric pollution) remains a question open to debate.<sup>27</sup> The outcome will depend on the political will of states, corporations, and citizens. Our purpose here is not to add one more proposal to the existing menu of policy goals for the post-COVID-19 time to come. Neither do we wish to celebrate the environmental impact of the corona crisis, which feels inappropriate at a time when so many are suffering from the disease and its related harms; dead relatives could not be buried<sup>28</sup>, bodies have decomposed

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pandemic-83da330fdc5d.

20 David Korten, 'From Emergency to Emergence', *CommonDreams*, 27 April 2020, <https://www.commondreams.org/views/2020/04/27/emergency-emergence>.

21 François Gemenne, 'Pourquoi la Crise du Coronavirus Est une Bombe à Retardement Pour le Climat', *Le Soir*, 28 March 2020, <https://plus.lesoir.be/290554/article/2020-03-28/pourquoi-la-crise-du-coronavirus-est-une-bombe-retardement-pour-le-climat>.

22 Julia Steinberger, 'Pandemonics: A Story of Life Versus Growth', *openDemocracy*, 8 April 2020, <https://www.openDemocracy.net/en/oureconomy/pandemonics-story-life-versus-growth/>.

23 Daniel Boffey, 'Amsterdam to Embrace “Doughnut” Model to Mend Post-Coronavirus Economy', *The Guardian*, 8 April 2020, <https://www.theguardian.com/world/2020/apr/08/amsterdam-doughnut-model-mend-post-coronavirus-economy?fbclid=IwAR2WmtAHRGDTJGRn4mm2rMdy1TsnxjckQ3JMGt-9smbtCyQs2VzapmoKLI>.

24 Ortwin Renn, 'Lessons from the Corona Crisis for Sustainable Crisis Management', *IASS Potsdam*, 18 April 2020, <https://www.iass-potsdam.de/en/blog/2020/04/lessons-corona-crisis-sustainable-crisis-management>.

25 Eliana Cusato, 'Beyond War Talk: Laying Bare the Structural Violence of the Pandemic', *EJIL: Talk!*, 3 May 2020, [https://www.ejiltalk.org/beyond-war-talk-laying-bare-the-structural-violence-of-the-pandemic/?fbclid=IwAR1Aqjx2-zJDcmK9jTzM8jh\\_07pmqA5fMLkf7tuU9Hdg\\_4UNIDfrVjt2Hs8](https://www.ejiltalk.org/beyond-war-talk-laying-bare-the-structural-violence-of-the-pandemic/?fbclid=IwAR1Aqjx2-zJDcmK9jTzM8jh_07pmqA5fMLkf7tuU9Hdg_4UNIDfrVjt2Hs8).

26 Shannon Osaka, 'The World Is on Lockdown. So Where Are All the Carbon Emissions Coming From?', *Grist*, 27 April 2020, <https://grist.org/climate/the-world-is-on-lockdown-so-where-are-all-the-carbon-emissions-coming-from/>.

27 Hervé Gardette, 'Ceci n'est (malheureusement) pas une Répétition Générale', *France Culture*, 1 April 2020, <https://www.franceculture.fr/emissions/radiographies-du-coronavirus/ceci-nest-malheureusement-pas-une-repetition-generale>.

28 Angela Giuffrida and Lorenzo Tondo, 'A Generation Has Died': Italian Province Struggles to Bury its

in trucks for overflow storage in funeral homes<sup>29</sup>, unprecedented unemployment rates exist<sup>30</sup>, and queues<sup>31</sup> before food banks and unaffordable medical bills are soaring.<sup>32</sup>

Instead, our objective is to explore how the turn to sensing—as a distinctive mode of engagement with socio-ecological issues—can productively re-imagine and address ongoing events such as the COVID-19 and climate change. In line with Fleur Johns, “[s]ensing, in this context, refers to the work of eliciting, receiving, and processing impressions and information, both in the mode of intuitions or feelings, and in terms of data.” Sensing, then “includes all bodily faculties of perception, but is not restricted to corporeal sensation, individual or collective.” Sensing, as such, “is never just about the body, as distinct from the mind”.<sup>33</sup>

In the next section, we start by theoretically defining and elaborating on the potential of sensing as a way to cope with events like the current pandemic and climate change, which demand a different configuration of existence. We see the turn to sensing as a response to Donna Haraway’s invitation to “stay with the trouble” of living and dying together on a damaged earth.<sup>34</sup> We perceive her suggestion as more conducive to a thinking that would provide a means to build more liveable futures. We then turn to specific examples of “citizen sensing” initiatives and conclude by questioning how the insights drawn from such “sensing practices” can fruitfully cope with the risks associated with the pandemic and climate change.<sup>35</sup>

## Sensing the Unknown

Both COVID-19 and climate change are examples of “hyperobjects”—a term coined by philosopher Timothy Morton to refer to entities that are so massively distributed in space and time that they defy not only our understanding, but also our control.<sup>36</sup> COVID-19 cannot be seen, yet its latent presence is felt everywhere. In the pandemic, COVID-19 cannot

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Coronavirus Dead’, *The Guardian*, 19 March 2020, <https://www.theguardian.com/world/2020/mar/19/generation-has-died-italian-province-struggles-bury-coronavirus-dead>.

- 29 Alan Feuer, Ashley Southall and Michael Gold, ‘Dozens of Decomposing Bodies Found in Trucks at Brooklyn Funeral Home’, *The New York Times*, 29 April 2020, [https://www.nytimes.com/2020/04/29/nyregion/bodies-brooklyn-funeral-home-coronavirus.html?smid=fb-nytimes&smtyp=cur&fbclid=IwAR2i78-u5xFYF\\_Pj4ExA4xS10oU8JX3HNdLd3DhIJGQykeJvKVRBdrK3k](https://www.nytimes.com/2020/04/29/nyregion/bodies-brooklyn-funeral-home-coronavirus.html?smid=fb-nytimes&smtyp=cur&fbclid=IwAR2i78-u5xFYF_Pj4ExA4xS10oU8JX3HNdLd3DhIJGQykeJvKVRBdrK3k).
- 30 Justin Wolfers, ‘The Unemployment Rate Is Probably Around 13 Percent’, *The New York Times*, 3 April 2020, <https://www.nytimes.com/2020/04/03/upshot/coronavirus-jobless-rate-great-depression.html>.
- 31 Nicholas Kulish, ‘“Never Seen Anything Like It”: Cars Line Up for Miles at Food Banks’, *The New York Times*, 8 April 2020, <https://www.nytimes.com/2020/04/08/business/economy/coronavirus-food-banks.html>.
- 32 Adam Gaffney, ‘America’s Extreme Neoliberal Healthcare System Is Putting the Country at Risk’, *The Guardian*, 21 March 2020, <https://www.theguardian.com/commentisfree/2020/mar/21/medicare-for-all-coronavirus-covid-19-single-payer>.
- 33 Johns, Fleur, ‘Data, Detection, and the Redistribution of the Sensible in International Law’, *American Journal of International Law* 111(1).
- 34 Donna Haraway, *Staying with the trouble*, Durham: Duke University Press, 2016.
- 35 Jennifer Gabrys and Helen Pritchard, Sensing Practices, in Rosi Braidotti and Maria Hlavajova (eds) *Posthuman Glossary*, New York: Bloomsbury, 2018, pp. 394-395.
- 36 Timothy Morton, *Hyperobjects*, Minneapolis: University of Minnesota Press, 2013.

be contained nor controlled, only its effects can be *mitigated* through specific guidelines<sup>37</sup> and physical distancing<sup>38</sup>, a survival tool revealing inequalities spanning class<sup>39</sup>, gender<sup>40</sup>, race<sup>41</sup> and mental health.<sup>42</sup> Similarly, climate change affects us all unequally<sup>43</sup>, despite it being “almost impossible for changes in climate to be perceived through individual experience”.<sup>44</sup> Both COVID-19 and climate change share the characteristics that Morton ascribes to hyperobjects.<sup>45</sup> They are “viscous” (they “stick” to us), “nonlocal” (their overall effects are globally distributed across space and time), “phased” (we can only experience local manifestations of them at any one time and place), and “inter-objective” (they are intertwined with other objects to which they cannot be reduced). Their reality and existence challenge human perception and imagination. Hyperobjects remain, in other words, elusive and invisible, although their reality is unquestionable. Even as they defy immediate and unmediated human experience, we can sense their omnipresence.

Against this backdrop, speculative approaches dispense with necessary phenomenological correlations between knowledge and first-person experience, and recognize the limits of human thought and imagination to relate to things that humans do not perceive directly.<sup>46</sup> They instead invite us to empathically relate to such events and sense their effects, even without unmediated access to them. While the realm of experience<sup>47</sup> is limited to actual observations and the process of learning by practical trial or proof, the definition of “sensing”<sup>48</sup> alludes to the faculty of perception and feeling. As such, it refers both to the detection of certain parameters and the emotions associated with what is revealed. Seen through this prism, sensing aspires to emotionally relate to the distress caused by certain events, whether the harm directly or only indirectly impacts us as human beings. In other words, sensing is an invitation to engage creatively, imaginatively, and speculatively with events beyond immedi-

37 John Kennedy, ‘Some Coronavirus Guidelines’, *New Yorker*, 23 March 2020, <https://www.newyorker.com/magazine/2020/03/30/some-coronavirus-guidelines>.

38 Saba Aziz, ‘Why ‘Physical Distancing’ Is Better Than ‘Social Distancing’’, *Al Jazeera*, 30 March 2020, <https://www.aljazeera.com/news/2020/03/physical-distancing-social-distancing-200330143325112.html>.

39 Colin Gordon, ‘Corona: The Inequality Virus’, *Jacobin Magazin*, 27 March 2020, <https://tinyurl.com/y6esw3yk>.

40 Helen Lewis, ‘The Coronavirus Is a Disaster for Feminism’, *The Atlantic*, 19 March 2020, <https://www.theatlantic.com/international/archive/2020/03/feminism-womens-rights-coronavirus-covid19/608302/>.

41 Keeanga-Yamahtta Taylor, ‘The Black Plague’, *New Yorker*, 16 April 2020, <https://www.newyorker.com/news/our-columnists/the-black-plague>.

42 Nicola Davis, ‘‘Urgent Studies Needed’ Into Mental Health Impact of Coronavirus’, *The Guardian*, 15 April 2020, <https://www.theguardian.com/world/2020/apr/15/urgent-studies-needed-mental-health-coronavirus-lockdown>.

43 United Nations Development Programme, ‘Climate Change and Inequalities in the Anthropocene’, in *Human Development Report 2019*, New York: UNDP, pp. 173-196, [hdr.undp.org/sites/default/files/hdr2019\\_chapter5.pdf](http://hdr.undp.org/sites/default/files/hdr2019_chapter5.pdf).

44 Andrew Bauer and Mona Bhan, *Climate without Nature*, Cambridge, UK: Cambridge University Press, 2018.

45 Timothy Morton, ‘Introducing the idea of ‘hyperobjects’’, *High Country News*, 19 January 2015, <https://www.hcn.org/issues/47.1/introducing-the-idea-of-hyperobjects>.

46 Graham Harman, *Speculative Realism: An Introduction*, New York: Wiley, 2018.

47 ‘Experience’, Online Etymology Dictionary, <https://www.etymonline.com/word/experience>.

48 ‘Sense’, Online Etymology Dictionary, [https://www.etymonline.com/word/sense#etymonline\\_v\\_44064](https://www.etymonline.com/word/sense#etymonline_v_44064).

ate human representation and experience. As Morton puts it, the mere fact of thinking their existence or sensing their effects requires us to care about such hyperobjects.<sup>49</sup>

## Governance

From a governance perspective, a number of studies have showed how a turn to sensing can be productive to re-envisage political perspectives and legal approaches to reconsider the more-than-human worlds we inhabit. As elaborated by David Chandler, sensing as a form of governance is based on correlation rather than causation, and depends on the disposition to “see things in their process of emergence or in real time”.<sup>50</sup> Sensing through new technologies can play a decisive role in environmental politics, by inspiring awareness and mobilizing publics. These forms of “material participation” can facilitate the capacity to detect the effects of relational interactions and cast them as either problems or possibilities.<sup>51</sup> As such, biosensory techniques can make imperceptible harms perceptible, knowable and measurable. They can even permit “a growing awareness of planetary life”.<sup>52</sup>

The effects of interactions between entities are rendered perceptible through forms of correlational sight, thereby enabling “new forms of (datafied) relational awareness”.<sup>53</sup> At a local level, the use of sensory technologies by individuals and communities allows for grassroots, bottom-up, and auto-empowering engagement with threats. Such engagements empower citizens by shifting the infrastructures, technologies, and practices of monitoring to less institutionalised arrangements.<sup>54</sup> From this perspective, “sensing citizens” are seen as part of “material-political arrangements and struggles over who generates, legitimizes, and has authority over data and how data is mobilized to make claims for environmental and other rights”.<sup>55</sup> With the burgeoning trend towards a “digitalization of mainstream environmental and climate governance”,<sup>56</sup> technology plays a key role in the constitution of socio-ecological assemblages, and promotes a novel ontology that changes the very nature of liberal governance.<sup>57</sup>

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49 Timothy Morton, ‘Introducing the idea of ‘hyperobjects’.

50 David Chandler, *Ontopolitics in the Anthropocene. An Introduction to Mapping, Sensing and Hacking*, Abingdon: Routledge, 2018.

51 Noortje Marres, *Material Participation. Technology, the Environment and Everyday Publics*, London: Palgrave Macmillan, 2015.

52 Elizabeth Johnson, ‘At the Limits of Species Being: Sensing the Anthropocene’, *South Atlantic Quarterly* 116 (2): 275–292.

53 David Chandler, ‘Ontopolitics in the Anthropocene. An Introduction to Mapping, Sensing and Hacking’.

54 Jennifer Gabrys, ‘Citizen Sensing, Air Pollution and Fracking: From ‘Caring About Your Air’ to Speculative Practices of Evidencing Harm’, *The Sociological Review* 65 (2\_suppl, 2017): 172-192.

55 Evelyn Ruppert, Ervin Isin and Didier Bigo, ‘Data politics’, *Big Data & Society* December 2017. doi:10.1177/2053951717717749.

56 Giovanni Bettini, Giovanna Gioli and Romain Felli, ‘Clouded Skies: How Digital Technologies Could Reshape “Loss and Damage” From Climate Change’, *WIREs Climate Change* 11(4, 2020): e650, <https://doi.org/10.1002/wcc.650>.

57 Davide Beraldo and Stefania Milan, ‘From Data Politics to the Contentious Politics of Data’, *Big Data & Society* July 2019, doi:10.1177/2053951719885967.

Citizens using sensing technologies are thereby recast as a “geo-socially networked community of sensors”.<sup>58</sup> As such, they are able to “make visible politically masked risks”<sup>59</sup> and reclaim their agency by shaping responses to the socio-ecological issues at stake. In the next section, we will explore how forms of “citizen sensing” can facilitate individuals and communities who are sensitive to the material, interdependent world they are part of, and act as proactive agents in their own governance.

## Citizen Sensing: From Sensing Radiations to COVID-19

In the immediate aftermath of the disastrous earthquake and tsunami that struck eastern Japan on March 11, 2011 and the subsequent meltdown of the Fukushima Daiichi Nuclear Power Plant, accurate and trustworthy radiation information was publicly unavailable.

Against this backdrop, a volunteer-driven non-profit organization called Safecast was formed to enable individuals “to monitor, collect and openly share radiation measurements”<sup>60</sup> and other data on radiation levels. The initiative “mobilized individuals and collectives”<sup>61</sup> in response to risks that were perceived as extremely urgent to monitor, namely the post-Fukushima radiation levels. Safecast can thus be regarded as a shock-driven initiative that constitutes a “successful [example of] citizen [sensing] for radiation measurement and communication after Fukushima.”<sup>62</sup> As the Safecast initiative grew in size, scope, and geographical reach, their mission soon expanded to provide citizens worldwide with the tools to inform themselves by gathering and sharing accurate environmental data in an open and participatory fashion. Through a form of auto-empowerment, Safecast participants were able to monitor their own homes and environments, thereby “free[ing] themselves of dependence on government and other institutions for this kind of essential information.” As described on Safecast’s website, this process gave rise to “technically competent citizen science efforts worldwide.”

## Responsiveness

Following the outbreak of COVID-19, the Safecast collective rapidly responded to the virus by setting up an information platform on the evolution of the crisis and a map of COVID-19 test-

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58 David Chandler, ‘Ontopolitics in the Anthropocene. An Introduction to Mapping, Sensing and Hacking’, p. 158.

59 Anna Berti Suman, ‘Making Visible Politically Masked Risks: Inspecting Unconventional Data Visualization of the Southeast Asian Haze’, in Martin Engebretsen and Helen Kennedy, *Data Visualization in Society*, Amsterdam: Amsterdam University Press, 2020, pp. 425-40.

60 Joke Kenens, Michel Van Oudheusden, Go Yoshizawa and Ine Vvan Hoyweghen, ‘Science by, With and for Citizens: Rethinking “Citizen Science” After the 2011 Fukushima disaster’, *Palgrave Communications* 6, 58 (2020), <https://doi.org/10.1057/s41599-020-0434-3>.

61 Anna Berti Suman, ‘Citizen Sensing for a Co-Governance of the Risk: the Fukushima Safecast case’, *LabGov*, 22 September 2017, <https://labgov.city/theurbanmedialab/citizen-sensing-for-a-co-governance-of-the-risk-the-fukushima-safecast-case/>.

62 Azby Brown, Pieter Franken, Sean Bonner, Nick Dolezal and Joe Moross, ‘Safecast: Successful Citizen-Science for Radiation Measurement and Communication After Fukushima’, *Journal of Radiological Protection* 36 (2016) S82–S101, doi:10.1088/0952-4746/36/2/S82.



ing<sup>63</sup> that provides a picture of where to obtain testing options. Over the years, Safecast had accumulated much experience and insights on “trust, crisis communication, public perception, and what happens when people feel threatened by a lack of reliable information.”<sup>64</sup> Yet, the Safecast collective still struggles to be heard and “many scientists ignore their data.”<sup>65</sup> Despite this scarce official recognition, Safecast took advantage of its experience and societal impact to rapidly respond to the current pandemic.

As observed by Safecast volunteers, “[w]e find ourselves again trying to better understand what is happening.” In a webinar on “Lessons we are learning from the COVID-19 pandemic for radiological risk communication”, Azby Brown—a volunteer at Safecast and director of the Kanazawa Institute of Technology’s Future Design Institute in Tokyo—drew several links between the nature of ionising radiations and COVID-19. By alluding to the invisible presence and constant risks posed by such hyperobjects, the invitation to the webinar started by stating that “[y]ou can’t see, smell, or taste it, but it may be a problem,” which applies equally to radiations as well as viruses. Elsewhere, Brown observed that:

Fear of the unknown is normal, and radiation and viruses are both invisible threats that heighten anxiety. Most people have almost no way to determine for themselves whether they have come into contact with either of these threats, and they find themselves dependent on specialists, testing devices, and government and media reports. If the government and media do not provide clear, credible explanations and prompt communications, misinformation and mistrust can easily take root and spread.<sup>66</sup>

For Brown, Safecast’s risk communication perspective was relevant in the current COVID-19 context because the collective gained experience after the Fukushima disaster. Despite major differences between ionising radiations and COVID-19, similarities in risks communications are worth exploring.

Analogous governmental failures on risk communication were observed regarding shortcomings in rapidly conveying clear messages to the public and communicating strategies based on non-conflicting expert and policy opinions. The ambiguous and incomplete information received from the authorities generated a sense of uncertainty and distrust for many citizens dependent on single sources of official information. Against this backdrop, initiatives such as Safecast that enabled people to control and monitor the presence and degrees of certain risks provided an alternative source of credible crowdsourced information. Beyond the immediate informational benefit for sensing citizens, such tools could further enable holding governments and officials to account.

63 Safecast, COVID-19 Testing Map, <https://covid19map.safecast.org/views/map>.

64 Azby Brown and Sean Bonner, ‘What the Fukushima Meltdowns Taught Us About How to Respond to Coronavirus’, *Bulletin of the Atomic Scientists*, 13 March 2020, <https://thebulletin.org/2020/03/what-the-fukushima-meltdowns-taught-us-about-how-to-respond-to-coronavirus/>.

65 Michiel Van Oudheusden, ‘Residents Rallied to Measure Radiation After Fukushima. Nine Years Later, Many Scientists Still Ignore Their Data’, 10 March 2020, <https://www.discovermagazine.com/environment/residents-rallied-to-measure-radiation-after-fukushima-9-years-later-many>.

66 Azby Brown and Sean Bonner, ‘What the Fukushima Meltdowns Taught Us About How to Respond to Coronavirus’.

## A Global Phenomenon

At the time of writing, citizen sensing initiatives tackling COVID-19 are multiplying around the world, as listed by the Australian Citizen Science Association<sup>67</sup>, and COVID-19 Italia Help.<sup>68</sup> Such citizen sensing practices “constitute ways of expressing care about environments, communities and individual and public health”.<sup>69</sup> As argued by Gabrys, these practices “are not just ways of documenting the presence of [threats],” they are also “techniques for tuning sensation and feeling environments through different experiential registers”. Granular monitoring by sensing citizens is particularly valuable in times of emergencies, when governments are faced with urgent, massive and systemic risks of spatial and temporal scales that defy immediate control—such as the current pandemic.

Civic “sentries”<sup>70</sup> can offer relief to affected people through solidarity networks and provide resources to policy-makers and scientists through wider access to grassroots-driven and information. Citizen sensing initiatives also enable lay people, turned into “sensing citizens,” to retain a greater degree of agency over the production and use of the data assembled. Against the ever-increasing rise of “bio-surveillance states”<sup>71</sup> and the development of “symptoms-tracking”<sup>72</sup> and “contact-tracing”<sup>73</sup> apps, “bottom-up innovations”<sup>74</sup> might help counter the acceleration of digital surveillance<sup>75</sup> that may be hard to scale back<sup>76</sup> after the pandemic.

Open-access data on citizens’ sensing may be considered more transparent and trustworthy by the public, and convey important information on widely shared, lived experiences. By making data about real but invisible threats available through the intermediary of sensing citizens, access to information and agency in knowledge production is redistributed. Finally, the increased “(datafied) relational awareness” and “forms of correlational

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67 ‘Citizen Science and COVID-19’, *Australian Citizen Science Association*, 20 April 2020, <https://citizenscience.org.au/2020/04/20/citizen-science-and-covid-19/>

68 COVID19 Italia, <https://covid19italia.help/>.

69 Jennifer Gabrys, ‘Citizen Sensing, Air Pollution and Fracking: From “Caring About Your Air” to Speculative Practices of Evidencing Harm’.

70 Laura Biffi, ‘L’Ambiente Difeso dai Cittadini, Sentinelle del Territorio’, *Nuova Ecologia*, 24 January 2018, <https://www.lanuovaecologia.it/lambiente-difeso-dai-cittadini-sentinelle-del-territorio/>.

71 Jeremy Cliffe, ‘The Rise of the Bio-Surveillance State’, *New Statesman*, 25 March 2020, <https://www.newstatesman.com/science-tech/2020/03/rise-bio-surveillance-state?fbclid=IwAR3XGAuzSpLb6bZP5xb-ThQs-WN7V8ZfuLH4xlnbSdvhee-uqv5rdCsCOTk>.

72 COVID Symptom Study, <https://covid.joinzoe.com/>.

73 Jaap-Henk Hoepman, ‘Google Apple Contact Tracing (GACT): a Wolf in Sheep’s Clothes’, *Xot Blog*, 19 April 2020, <https://blog.xot.nl/2020/04/19/google-apple-contact-tracing-gact-a-wolf-in-sheeps-clothes/>.

74 Cornelia Dinca, ‘Top-down & Bottom-up Innovation in an era of COVID-19’, *Amsterdam Smart City*, 1 April 2020, <https://amsterdamsmartcity.com/posts/top-down--bottom-up-innovation-in-an-era-of-covid>.

75 ‘Coronavirus Apps: the Risk of Slipping Into a Surveillance State’, *Financial Times*, 27 April 2020, <https://www.ft.com/content/d2609e26-8875-11ea-a01c-a28a3e3fbd33>.

76 Andrew Roth, Stephanie Kirchgaessner, Daniel Boffey, Oliver Holmes, Helen Davidson, ‘Growth in Surveillance May Be Hard to Scale Back After Pandemic, Experts Say’, *The Guardian*, 14 April 2020, <https://www.theguardian.com/world/2020/apr/14/growth-in-surveillance-may-be-hard-to-scale-back-after-coronavirus-pandemic-experts-say>.

sight” that are produced can create new appreciations of the connections between human and non-human coexisting lifeforms.<sup>77</sup>

## Concluding Thoughts

As hyperobjects, both COVID-19 and climate change defy not only our understanding but also our control.<sup>78</sup> Their causes and effects are so massively dispersed across space and time that they evade unmediated appearance. The impacts of hyperobjects operate through forms of ‘slow violence’<sup>79</sup>, which are “often attritional, disguised, and temporally latent, making the articulation of slow violence a representational challenge”.<sup>80</sup> Only partial, local and deferred manifestations can be captured through experience. Our way of relating and responding to such hyperobjects depends on temporal, spatial and emotional predicaments. The more temporally-immediate, spatially-proximate and emotionally-tangible hyperobjects are, the greater and quicker our responses tend to be. Temporal, spatial, and emotional scales are central to our ability to sense the presence of invisible threats such as viruses and changes in the climate.

While socio-ecological threats posed by climate change have been present for decades, responses remained relatively marginal in light of the risks at stake. Conversely, while the health threats posed by the COVID-19 are relatively shorter-term, these risks triggered immediate and radical responses. The fact that the COVID-19 is sensed as a direct risk to individuals or vulnerable relatives prompts instant reactions. The sensed temporal and spatial proximity of the invisible threat brings us to important questions.

The current pandemic brought to light what climate activists deplored for so long, namely that we tend to care more for risks posed to our individual than collective conditions. A sense of emotional distance is generated by spatial and temporal gaps. This self-centred sentiment is reinforced by an anthropocentric appraisal that limits our ethics of care<sup>81</sup> to the sole concern for the human species, instead of striving to “support the flourishing of other animals and natural things”<sup>82</sup> with which we are intrinsically entangled. While pessimistic projections<sup>83</sup> on climate change have often been framed as triggering a sense of denial, paralysis or aporia, the current pandemic shows how emotions such as fear, anxiety, and dread<sup>84</sup> can also lead to mobilization, collective concern, and action.

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77 David Chandler, ‘Ontopolitics in the Anthropocene. An Introduction to Mapping, Sensing and Hacking’.

78 Ed Yong, ‘Why the Coronavirus Is So Confusing’, *The Atlantic*, 29 April 2020, <https://www.theatlantic.com/health/archive/2020/04/pandemic-confusing-uncertainty/610819/>.

79 Rob Nixon, *Slow Violence and the Environmentalism of the Poor*, Cambridge: Harvard University Press, 2013.

80 Thom Davies, ‘Slow Violence and Toxic Geographies: ‘Out of sight’ to whom?’, *Environment and Planning C: Politics and Space* April 2019, doi:10.1177/2399654419841063: 2.

81 María Puig de la Bellacasa, *Matters of Care*, Minneapolis: University of Minnesota Press, 2017.

82 Beth Lord, ‘We Are Nature’, *AEON*, 28 April 2020, <https://aeon.co/essays/even-the-anthropocene-is-nature-at-work-transforming-itself>.

83 Fiacga Heneghan, ‘Is There a Limit to Optimism When it Comes to Climate Change?’, *AEON*, 13 April 2020, <https://aeon.co/ideas/is-there-a-limit-to-optimism-when-it-comes-to-climate-change>.

84 Jennifer Ladino, ‘Who’s Afraid of the Climate Crisis? Fear, Anxiety, Dread, and Pandemic Panic’, *Edge*

Emotions are, ultimately, about social movement; the root of the word “emotion” is the Latin *emovere*, which implies both movement and agitation.<sup>85</sup> Despite the risks of strategic exploitation of fear or despair by political actors instrumentalizing a “state of exception”,<sup>86</sup> such emotions can unleash an enhanced sense of solidarity and cohesion through increased awareness of our fragile state of coexistence and new forms of collective attachment.<sup>87</sup> This is true at the human level and at a “more-than-human” level, by inviting people to be alert and attentive to humans’ impact on and interdependence with the natural world we are part of. Such sensibilities can even give rise to a sense of cross-species shared vulnerability, where hope and grief<sup>88</sup> enable us to re-envision different forms of “collaborative survival”.<sup>89</sup>

In this chapter, we modestly explored how citizen sensing initiatives can help bridge the temporal, spatial, and emotional distance between human (re)actions. They can present yet-invisible threats through self-production of independent knowledge and agency. As Gabrys reminds us:

These practices are not just ways to rework the data and evidence that might be brought to bear on environmental problems. They are also ways of creating sensing entities, relations, and politics, which come together through particular ways of making sense of environmental problems.<sup>90</sup>

We argue that, by recasting the actants and subjectivities involved, the technological and data-based sensors used by “sensing citizens” have a world-making effect by facilitating awareness and intelligibility of certain threats. Physical isolation being implemented globally doesn’t mean that we need to feel isolated and powerless. Daily citizen science involves re-imagining scales and the potential of working together to provide a sense of connection and purpose.<sup>91</sup> In reconfiguring the “distribution of the sensible”<sup>92</sup>—a “system of self-evident facts of sense perception that simultaneously discloses the existence of something in common and the delimitations that define the respective parts and positions

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*Effects*, 21 April 2020, <https://edgeeffects.net/whos-afraid-of-the-climate-crisis-fear-anxiety-dread-and-pandemic-panic/>.

85 ‘Emotion’, Online Etymology Dictionary, <https://www.etymonline.com/word/emotion>.

86 Joseph Owen, ‘States of Emergency, Metaphors of Virus, and COVID-19’, *Verso*, 31 March 2020, <https://www.versobooks.com/blogs/4636-states-of-emergency-metaphors-of-virus-and-covid-19>.

87 Sean Illing, ‘This Is a Time for Solidarity’, *Vox*, 15 March 2020, <https://www.vox.com/2020/3/13/21172237/coronavirus-covid-19-albert-camus-the-plague>.

88 Lesley Head, *Hope and Grief in the Anthropocene*, Abingdon: Routledge, 2016.

89 Anna Lowenhaupt Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*, Princeton: Princeton University Press, 2015.

90 Jennifer Gabrys, ‘Citizen Sensing, Air Pollution and Fracking: From “Caring About Your Air” to Speculative Practices of Evidencing Harm’.

91 Australian Citizen Science Association, ‘Citizen Science and COVID-19’, <https://citizenscience.org.au/2020/04/20/citizen-science-and-covid-19/>.

92 Allan Parsons, ‘Distribution of the sensible’, *Compendium*, 5 October 2017, <https://compendium.kosawese.net/term/distribution-of-the-sensible/>.

within it”<sup>93</sup>—new avenues are opened up for citizens to foresee, understand, visualize threats, and (ac)count for the damages caused.<sup>94</sup>

Beyond the realm of immediate perception and reactions, decentralized, grassroots-driven, and cooperative sensing technologies may also redistribute agency to challenge more official monitoring infrastructures, and galvanize appropriate political responses. Politics, ultimately, “revolves around what is seen and what can be said about it, around who has the ability to see and the talent to speak, around the properties of spaces and the possibilities of time”.<sup>95</sup> These configurations of the sensible, we argue, map an important terrain for rethinking the politics of hyperobjects such as COVID-19 and climate change.

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93 Jacques Rancière, *The Politics of Aesthetics*, New York: Bloomsbury, 2006.

94 Giovanni Bettini, Giovanna Gioli and Romain Felli, ‘Clouded Skies: How Digital Technologies Could Reshape “Loss and Damage” From Climate Change’.

95 Jacques Rancière, *The Politics of Aesthetics*.

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