

***Explaining Absolute Absences: A Critical Reply to Scott Frickel***  
**Abby Kinchy, Rensselaer Polytechnic Institute**

In science and technology studies, the recent turn to studies of ignorance (including secrecy, suppression of research agendas, and abandoned knowledge) has offered new ways of revealing that “things could have been otherwise.” In his insightful contribution on how to study what is absent in modern technoscience practice, Scott Frickel [observes](#) that most of the new research in this vein considers “things that are not there’ but were there once, or have become hidden, or are somewhere else” (Frickel 2014, 87). In contrast, however, he calls on us to attend to “absolute” absences, the “things that are not there or anywhere else and probably never were” (87-88).

Frickel’s essay offers valuable methodological guidance for empirical studies of absences in technoscience, urging researchers to “identify as specifically as possible what exactly they are looking for,” and to be precise about the definition of absence and the parameters of the case (89). Furthermore, Frickel argues that we should develop causal analyses, not just to describe and explore the varieties of absence, but to explain them. He writes:

Research on absences should follow feminist and post-colonial studies scholars in aiming to derive explanations about their causes. Causal arguments will deepen understanding of the structural conditions that bring about absences, specific mechanisms through which absences are produced, and patterns of similarity and difference that emerge across cases.

However, the practical implications of studying things that were never there or that never happened are extremely challenging, which may be why so few have attempted it. Indeed, simply specifying an absolute absence (as a step before trying to explain how it was produced) is fraught with methodological difficulties. What kinds of absence matter, and how do we specify them well enough to study them empirically? I offer my own experiences here in hopes of furthering the important, practical work of developing methods of empirically studying absence. In doing so, I hope to cultivate the “modest reflexive awareness” that Frickel encourages about the consequences of our questions, methods, and other decision points in the research process.

In my research, I have grappled with the problem that, in many places, even simple assessments of water quality are lacking. In rural Pennsylvania, where a natural gas drilling boom is underway, residents and environmental activists fear that the gas industry is polluting waterways. However, in many watersheds, there is an absence of necessary infrastructure and capacity to monitor changes.

The absence of water quality monitoring capabilities is not unusual; similar absences can be found everywhere. Here are some things that nobody knows:

Whether the creek near my old house is more acidic than last year.

The arsenic levels in my neighbor's drinking water well.

If the gas line under the street outside my office is leaking methane into the atmosphere.

Whether I am inhaling benzene right now.

These are everyday, all-the-time, absolute absences of knowledge. No one in particular is keeping this information secret or shrouding it with doubt. The science isn't difficult; with the proper testing equipment, you could fairly easily find out the answers, filling in a knowledge gap. But what about the countless other wells, creeks, and gas lines? And what if it changes tomorrow? The task of producing this kind of knowledge is enormous, and not enough of us do it, or pay for it, or invent tools to make it easier.

Many believe a lack of knowledge is our "native state," the "resource" that drives science, to borrow from Robert Proctor's [typology of ignorance](#). But the aforementioned absences are not some kind of unsolved mystery; they are merely a failure to prioritize environmental monitoring. It may seem absurd to imagine a truly comprehensive environmental monitoring system, yet when compared to the extensive record-keeping and tracking that is involved in, say, the payment of taxes, it doesn't seem so outlandish.

When I began my research on unconventional natural gas development ("fracking"), it was hard to see the contours of the absence. I knew a lot of people were worried that gas drilling was going to have devastating effects on water quality, and I had a sense that some waterways, but not others, were being monitored by government agencies, scientists, and environmental groups. My aim was to explain why so little was known about the impacts of gas drilling—why the industry could claim that there were no proven negative impacts.

Before trying to explain the absence, I first needed to specify it and identify the parameters of my case (as Frickel suggests). My first approach was to listen to scientific insiders and outsiders about "specified ignorance" in order to define the absence that I would study. My second approach was to locate absences by creating maps of environmental monitoring locations. While both of these research activities are still ongoing, I believe my experiences so far may be informative for others who may be deciding to undertake similar studies themselves.

My first approach was informed by studies of "undone science" (Frickel [2009](#); Hess [2009](#)). Gwen Ottinger ([2013](#)) and Barbara Allen ([2013](#)), for instance, have shown how environmental justice activists identify the failure of regulators to appropriately study industrial pollution. My goal was not just to investigate what social movements do when

facing a lack of scientific knowledge; I wanted to learn from people close to the case about what, exactly, was absent, and then to study *how that absence came to be*.

Rather naively, thought I could simply ask people about the kinds of data, or studies, or information they needed or wished to see. Scientific experts, used to justifying their work by pointing to knowledge gaps, interpreted my questions narrowly. They identified particular studies they would like to do, data they would like to have, or funding constraints that kept them from doing research they thought was important. Many environmental activists and rural residents, on the other hand, seemed to find my questions incomprehensible. They answered in broad terms, pointing to the general failures of regulatory authorities and the sense that they were facing enormous, unspecifiable unknowns about the calamities that gas development might bring. To use Jennifer Croissant's useful contrast, many of the scientists I interviewed were concerned about what was "unknown-at-this-time, to be solved with more research or better modeling." Activists and other concerned citizens, on the other hand, were anxious about what Croissant [describes](#) as "knowledges that are fundamentally based on stochastic process by which probability, and thus uncertainty, are endemic to the system" (Croissant 2014, 7). Nonscientist critics of the gas industry rarely specified a particular absence, but were far more concerned with unknown unknowns and the likelihood of unpleasant surprises.

These divergent responses, while interesting in themselves, posed a variety of challenges in my efforts to specify the particular "absence" that I should study. The scientists' answers led me to examine the politics of funding for routine environmental monitoring (the kind of scientific work that would be needed for tracking cumulative changes over time). This research, still ongoing, has been fruitful, and I have begun to understand why water quality knowledge is scarce, and how that might have been otherwise. The concerned citizens' statements, however, were much more difficult to turn into specified absences.

By definition, we lack knowledge about future surprises. This kind of ignorance is one of things that make controversies about new technologies and industrial projects so difficult to resolve. But can we explain, sociologically, the absence of knowledge about the future? I doubt it. However, we can study the social effects of sensing that there is the possibility of surprise. Some research, particularly by Matthias Gross ([2010](#)), has focused on how decisions are made in the context of this form of ignorance. Rather than trying to "explain" absence in this case, perhaps it is more important to explain why people in positions of power—the decision-makers who have eased the way for the oil and gas industry to explore increasingly risky sources of fossil fuel—persistently ignore the anxieties about unknown unknowns that are expressed by people living in natural gas boomtowns.

Other discoveries have also led me away from the task of explaining absences. I am increasingly aware of the problem I highlighted in my opening paragraphs: the absence of

environmental data is vast and overwhelming. In this context, it may be less interesting to explain how the absence of water quality knowledge came to be than it is to explain why certain absences become socially significant while others are accepted as normal. For example, since my initial interviews, the fracking debate has attuned many people, scientists and nonscientists alike, to the problem that “baseline” data is lacking in most streams, which would make it difficult to prove that the gas industry caused damage. At the same time, it is probably safe to say that they (as I, and probably you) have never questioned that in many places (particularly outside of cities) no one is keeping track of air quality.

I will only briefly comment on my second approach to specifying absences. As I have already indicated, I agree with Frickel that it is important to develop causal arguments about absence (despite the caveats I have just presented). In particular, I think we should explore theories that posit a relationship between absences and social characteristics, and develop empirical studies to explore these propositions. Frickel’s own research ([2009](#)) on soil contamination after Hurricane Katrina is a great example of this sort of work, because it examines whether absences of environmental data are more likely to be found in neighborhoods that are poor or African-American (much like the absence of supermarkets and green spaces in those neighborhoods).

Inspired by this work, I also used GIS mapping to identify knowledge gaps and analyze their spatial relationships with social features. In the United States, only a small percentage of streams are ever sampled by regulatory scientists. Therefore, for this analysis, I specified absence quite narrowly – absence of water samples – so that it could be recorded and analyzed spatially, on a map. My expectation was that absences had something to do with either the social characteristics of the people living in the watersheds (race, income, education) or with the cultural valuation of particular places. That is, I suspected that some bodies of water have, historically, acquired social importance that transcends a particular place, thus attracting resources for water monitoring.

I will not detail my findings here. However, there is one lesson that I wish to share. Like Frickel, who calls attention to the underutilized tool of GIS, I think there is enormous potential for studying absences through mapping. However, in the spirit of modest reflexive awareness, I must point out the inherent shortcoming to this approach. Mapping absences is a peculiar kind of task, in which absences are revealed only by visualizing what is present (e.g. water monitoring stations) and then looking at the spaces between them. Therefore, it is essential that the analyst specify that the absences illustrated are not “absolute” absences, but rather the gaps in a particular dataset, which is itself probably a faulty representation of the world. To give an example, I created what I believed was a complete record of all of the locations where Pennsylvania’s environmental regulators routinely monitored water quality. However, I have subsequently learned that regulators collect lots of data that is never shared in the official database that I used to construct my map. In short, this means that I have made a map of the gaps in *publicly accessible* water

quality data, but not a map of the gaps in all regulatory data (much of which is inaccessible). It is a subtle distinction, but one that serves as a reminder to remain reflexive about the absences in our own representations of the world.

Frickel observes that studying absence is “akin to mapping an uncharted wilderness—there are few sure paths to follow, a condition that makes it virtually obligatory to repeatedly lose one’s way” (Frickel 2009, 93). My adventures through this wilderness have begun to lead away from the objective of explaining absence, *per se*, and toward explaining how, when, and where absences are recognized and framed as problems (or not). My steps in this direction are a result of the process of grappling with this particular kind of case, and I suspect that those working on other areas of ignorance (about disease causation, for example) will have entirely different experiences and challenges. I would welcome more empirical studies of absences and ignorance that are explicit about these methodological challenges and the research strategies that have been successful.

**Contact details: [kincha@rpi.edu](mailto:kincha@rpi.edu)**

## References

- Allen, Barbara L. *Uneasy Alchemy: Citizens and Experts in Louisiana’s Chemical Corridor Disputes*. MIT Press, 2003.
- Croissant, Jennifer L. “[Agnotology: Ignorance and Absence or Towards a Sociology of Things That Aren’t There.](#)” *Social Epistemology* 28, no. 1 (January 02, 2014): 4–25. doi:10.1080/02691728.2013.862880.
- Frickel, Scott. “[Absences: Methodological Note about Nothing, in Particular.](#)” *Social Epistemology* 28, no. 1 (January 02, 2014): 86–95. doi:10.1080/02691728.2013.862881.
- Frickel, Scott, Richard Campanella, and M. Bess Vincent. “Mapping Knowledge Investments in the Aftermath of Hurricane Katrina: A New Approach for Assessing Regulatory Agency Responses to Environmental Disaster.” *Environmental Science & Policy* 12, no. 2 (2009): 119–133.
- Frickel, Scott, Sahra Gibbon, Jeff Howard, Joanna Kempner, Gwen Ottinger, and David J. Hess. “Undone Science: Charting Social Movement and Civil Society Challenges to Research Agenda Setting.” *Science, Technology & Human Values* 35, no. 4 (October 2009): 444–473. doi:10.1177/0162243909345836.
- Gross, Matthias. *Ignorance and Surprise: Science, Society, and Ecological Design*. The MIT Press, 2010.

Hess, David J. “The Potentials and Limitations of Civil Society Research: Getting Undone Science Done.” *Sociological Inquiry* 79, no. 3 (August 2009): 306–327. doi:10.1111/j.1475-682X.2009.00292.x.

Ottinger, Gwen. *Refining Expertise: How Responsible Engineers Subvert Environmental Justice Challenges*. New York: NYU Press, 2013.

Proctor, Robert N. “Agnotology: A Missing Term to Describe the Cultural Production of Ignorance (and Its Study).” In *Agnotology: The Making and Unmaking of Ignorance*, edited by Robert N. Proctor and Londa Schiebinger, 1–33. Stanford, CA: Stanford University Press, 2008.