blogs.lse.ac.uk
http://blogs.lse.ac.uk/usappblog/2016/02/26/lack-of-action-from-state-and-federal-government-means-that-community-organisations-are-picking-up-the-slack-of-monitoring-the-effects-of-fracking-in-the-northeast/

Lack of action from state and federal government means that community organisations are picking up the slack of monitoring the effects of fracking in the Northeast.

The rise of hydraulic fracturing, or fracking, has been controversial, with many campaigners expressing concern about the implications for the local environment, including streams and rivers. In new research, **Abby Kinchy** *writes that monitoring of the effects of fracking on local watersheds in the Marcellus Shale region of New York and Pennsylvania by state, local, and multistate government is often patchy, and that many local volunteer and non-profit organisations are taking up the slack of such monitoring. She finds that these organisations were the only ones monitoring 22 percent of watersheds in the Marcellus Shale region, showing that governments could and should be doing much more to monitor the effects of fracking in this region.*

Are efforts to monitor water quality reaching the watersheds that are most heavily impacted by Marcellus Shale gas drilling? My colleagues and I in the Watershed Knowledge Mapping Project at Rensselaer Polytechnic Institute (Simona Perry, Sarah Parks, and Kirk Jalbert) wanted to find out. With a grant from the National Science Foundation, we surveyed watershed protection organizations across Pennsylvania and New York to find out where volunteers and nonprofit organizations— which we refer to as civil society organizations (CSOs)—were monitoring streams for the impacts of fracking. We also sifted through publicly-available government databases on water quality, in order to determine where, and how frequently, state, federal, and other government agencies were sampling surface water quality.

What we found surprised us. CSOs were monitoring an impressively large proportion of watersheds in Pennsylvania —and many in the Marcellus Shale region of New York, as well (despite the ban on fracking there). Government agencies were also monitoring surface water in more watersheds than we assumed, given the criticism of those agencies that we often heard from watershed advocates. State governments report to the EPA about the status of water quality, and the US Geological Survey samples water quality nationwide. In addition, multi-state agencies such as the Susquehanna River Basin Commission (SRBC) and the Delaware River Basin Commission (DRBC) have water monitoring programs.

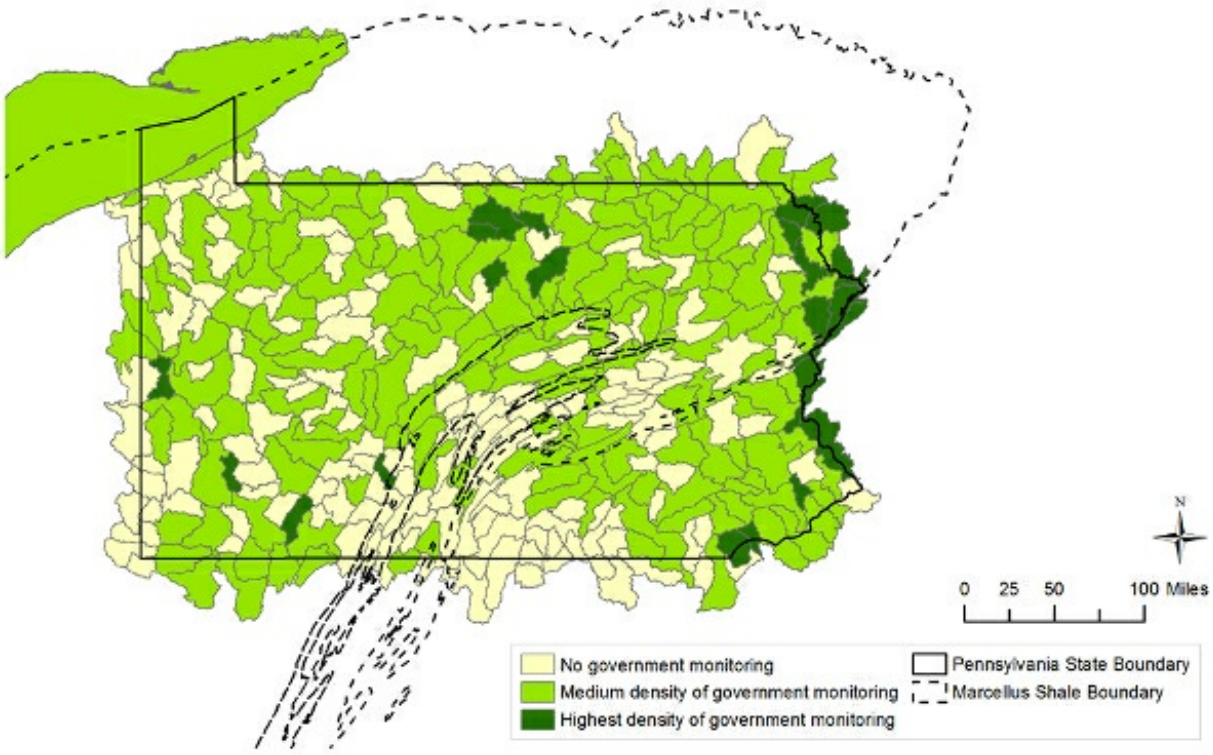
Yet, despite all of this water monitoring activity, *in some of the watersheds with the highest density of gas shale gas wells, there is little or no water monitoring* by CSOs or government agencies. We refer to these unmonitored places “spatial knowledge gaps.” There are many reasons why we should be concerned about these gaps. Lack of knowledge obscures the dangers of industrial development, leading to public uncertainty, faulty conclusions about environmental impacts, and obstacles to effective governance.

In our view, it is important to view knowledge gaps not just as a science or public policy problem, but also a manifestation of social inequality and environmental injustice. Uneven distribution of public and private water monitoring efforts and resources place some communities at a disadvantage compared to others when responding to environmental threats. Regions that lack long-term water quality data are less able to determine how their water quality is changing due to shale gas development. While this negligence may be unintended, knowledge gaps ultimately can have a disempowering effect for those who contest the actions of big oil and gas companies or the conclusions of regulatory scientists.

As we found in our recent research, there are significant gaps in government monitoring. Let’s take a closer look at

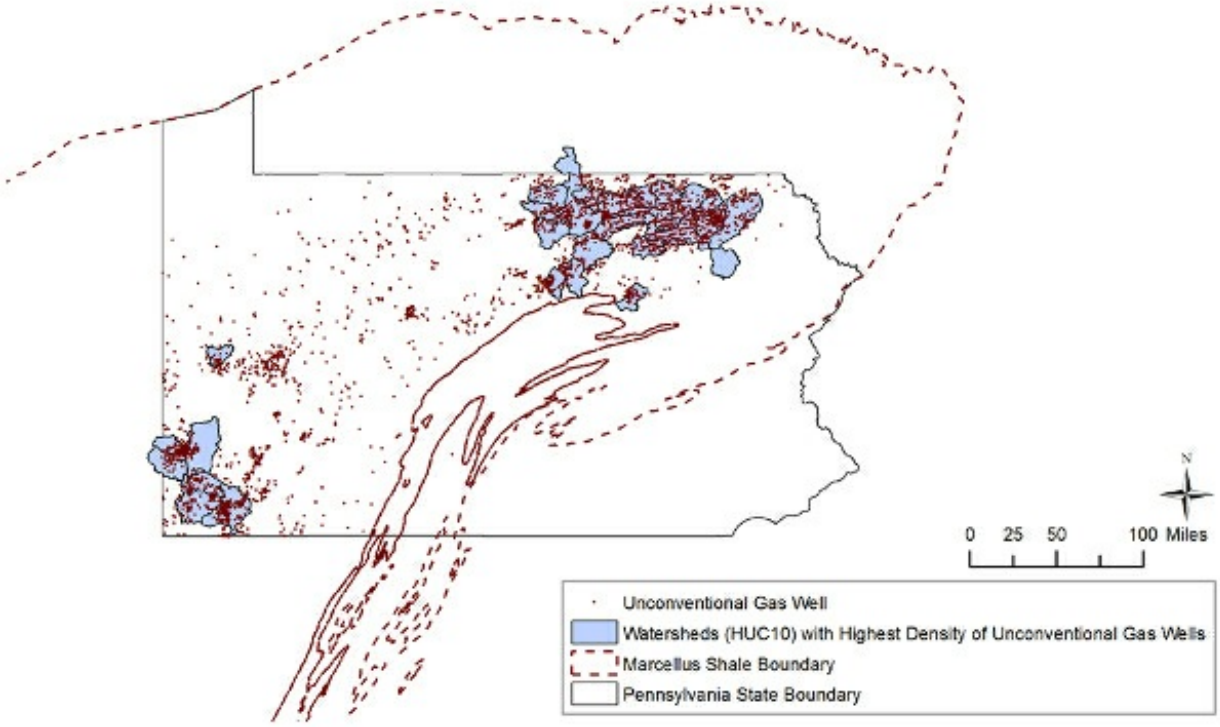
water monitoring in Pennsylvania. In 2011, only 53 percent of watersheds in Pennsylvania were continuously or frequently monitored by state, federal, or multistate government agencies. Only 22 watersheds, out of 332 watersheds in the state, had more than 3 monitoring locations per 100 square miles (See Figure 1).

Figure 1 – Density of government monitoring by watershed (frequent and continuous monitoring locations (2011 data)



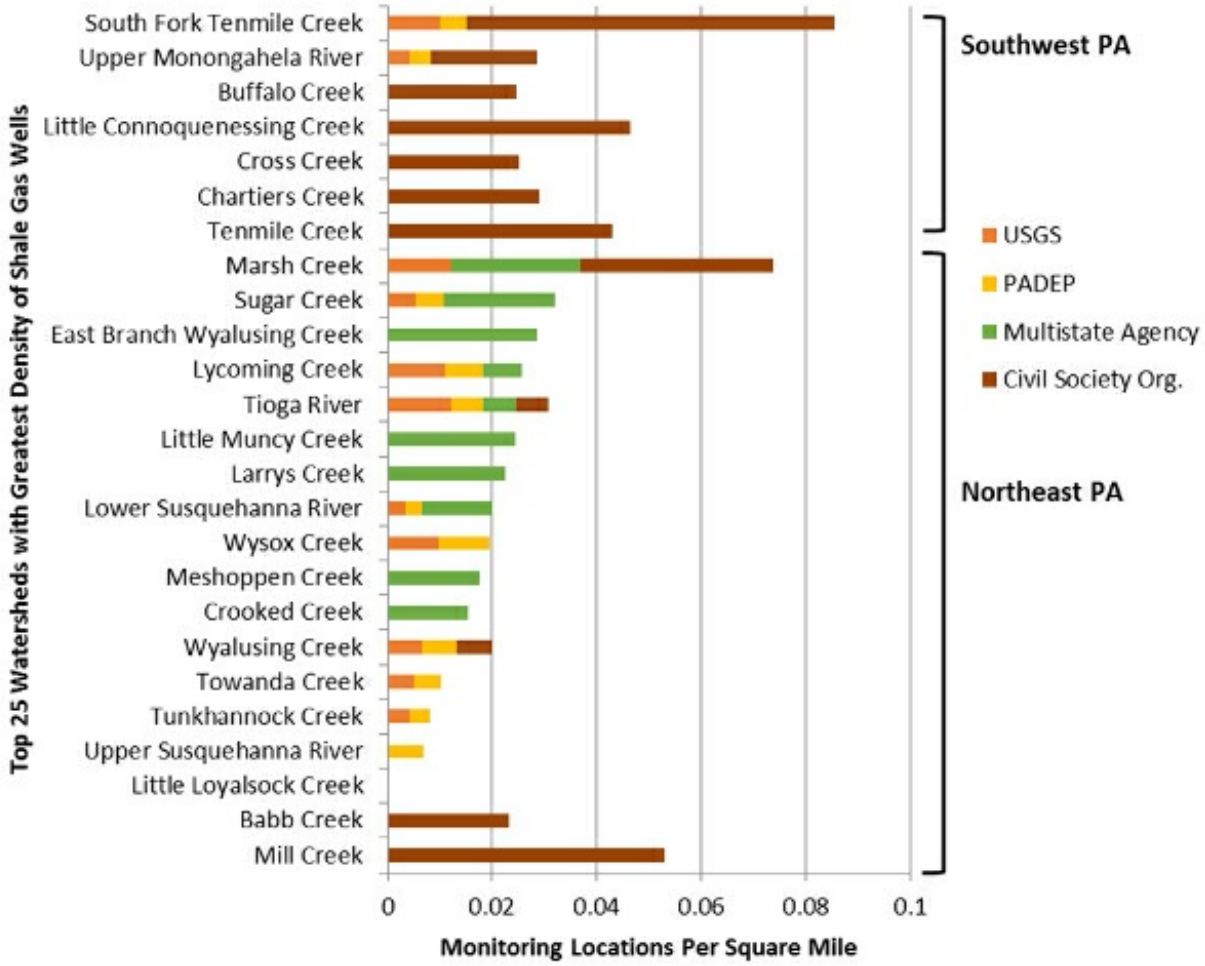
It is revealing to look at the 25 watersheds that have the greatest density of shale gas wells (see Figure 2). As of 2013, these 25 watersheds had, on average, about one shale gas well per square mile.

Figure 2 – 25 watersheds with the highest density of shale gas wells in 2013



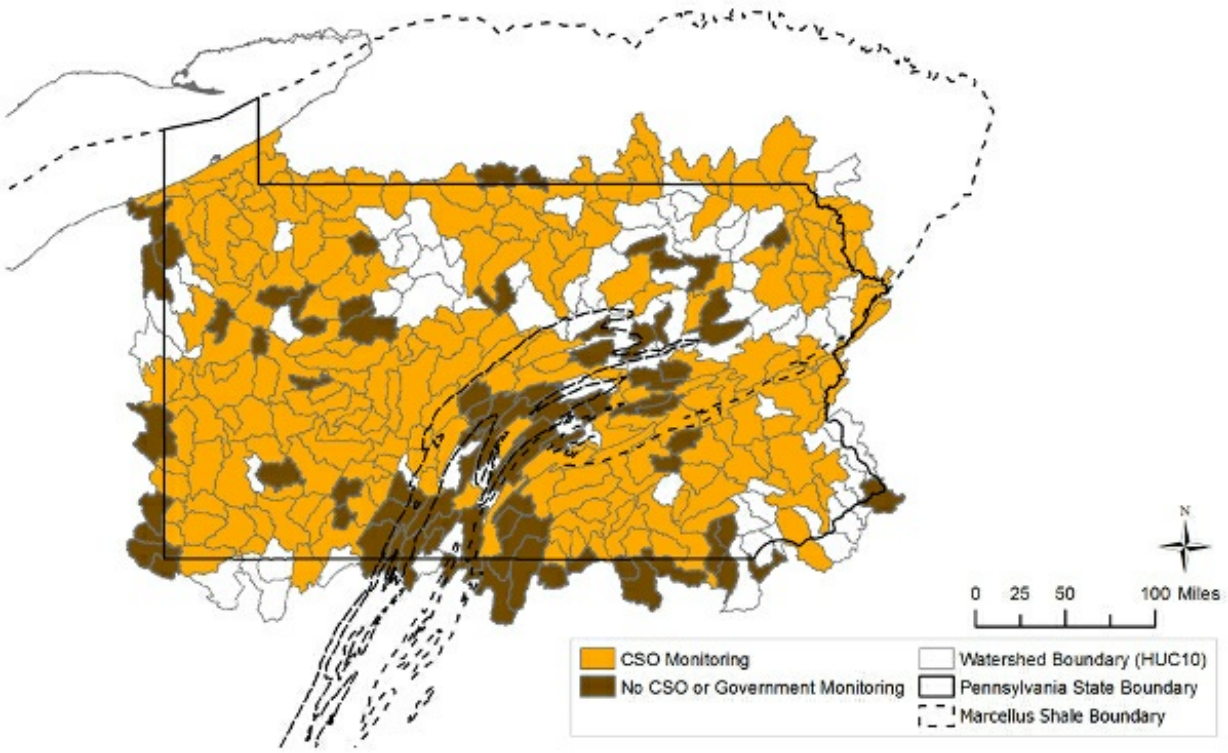
The two major gas drilling regions of Pennsylvania look very different, when it comes to government efforts to monitor watersheds. Of the 25 watersheds with the highest density of shale gas wells, seven are in southwestern Pennsylvania, but there is a relative absence of government monitoring there. Strikingly, five of the seven southwestern watersheds on this list had no frequent or continuous government monitoring in 2011. In comparison, the Susquehanna River Basin Commission's water monitoring program made north-eastern Pennsylvania a more highly monitored area (see Figure 3).

Figure 3 – Density of stream monitoring locations in watersheds with high concentration of shale gas wells (2011 data)



Volunteers and non-profit organizations have frequently stepped up to fill in the gaps in government water monitoring (see Figure 4). By 2012, CSOs were monitoring Marcellus-related drilling impacts in 56 percent of watersheds in the Marcellus Shale region of Pennsylvania—a greater proportion of watersheds than was monitored by state, federal, and multistate agencies combined. Even more impressively, CSOs were monitoring at twice the density of government monitoring locations—over 2 per 100 square miles.

Figure 4 – CSO monitoring and remaining gaps



As shown in the Figure 3 above, of the 25 watersheds with the highest density of shale gas wells, 12 were monitored by CSOs—primarily in the southwestern watersheds that had little or no government monitoring. CSOs also made notable contributions throughout the rest of the Marcellus Shale region of Pennsylvania. Remarkably, CSOs were the *sole source of continuous or frequent monitoring data* in 60 (22 percent) of the watersheds in the Marcellus Shale region.

Although the contributions of CSOs are truly impressive and are filling a public need, we have some concerns about relying on citizen scientists when government agencies fall short. It is problematic to expect civil society to pick up the slack when government is unable to fully carry out necessary environmental research, particularly since we found that not all communities are equally equipped to carry out "citizen science" in their watersheds.

We are also concerned about the relationship between government and CSO monitoring efforts. In our extensive interviews with water monitoring groups and regulators, we observed that CSO monitoring rarely has a meaningful role in the regulatory process.

While CSOs should not be seen as a one-to-one substitute in the work of environmental oversight, these organizations have proven effective in collecting meaningful data in regions impacted by shale gas extraction. Volunteers not only make quantitative measurements, but they are also the "eyes and ears" on the ground, noticing steam bank erosion, fish kills, methane bubbles, and other unusual watershed events. Regulators and policymakers should recognize the value of citizen scientists as a source of environmental knowledge. This means not just adding volunteers' measurements to larger datasets, but actively consulting CSOs as experts on the watersheds they monitor.

Since completing this study, we collaborated with FracTracker to update our data on CSO monitoring efforts and to present the research through interactive maps. To explore these maps, and for more commentary on this study, please visit "Mapping the Gaps: The Spatial and Social Inequalities of Water Monitoring".

A longer version of this article was published by the FracTracker Alliance.

Featured image credit: WCN 24/7 (Flickr, CC-BY-NC-2.0)

This article is based on the paper, 'Fractured knowledge: Mapping the gaps in public and private water monitoring efforts in areas affected by shale gas development', in Environment and Planning C: Government and Policy.

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